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ORIGINAL ARTICLES.

SECOND NOTE RELATIVE TO THE MORE EFFICIENT UTILIZATION OF THE SPARK-GAP RADIATIONS.

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I.

IN the June number of the *Journal of Cutaneous Diseases* I published a "Preliminary Note" on the above topic in which I stated that I had discovered some new "rays" given out by my "ultra-violet" condenser spark-gap lamp. (Fig. 1.)

This lamp is furnished in front with a thin quartz plate which is transparent to ultra-violet rays, while glass is opaque to them. If the face of the lamp with the quartz *in situ* be applied to a piece of photographic paper (Solio) and the

Fig. 1.



The author's ultra-violet ray lamp.

lamp actuated by a suitable coil, a strong impression will be made on the paper in about thirty seconds. If the experiment be repeated with the quartz removed, the result is substantially the same.

Ultra-violet rays, as is well known, will discharge an electroscope if charged *negatively* but *not* if charged *positively*.

On trial I found that the lamp with the quartz in front discharged the *negative* electroscope in about twenty seconds, but with the quartz removed discharged it instantly; that is within less than one second. I found further that the radiations from the unobstructed spark would discharge an electroscope charged *positively*.

It was clear from this that in addition to the ultra-violet rays we were dealing with another class of radiations that only slightly affected the photographic plate, but acted very energetically on the electroscope.

In default of any means of determining the exact nature of these radiations I assumed that they were negative electrons, and predicted that they would act very energetically on the skin or

any other tissue with which they came in contact; and that the character of the reaction would resemble that from X-rays and radium, except that it would make its appearance more promptly. This is the substance of the "preliminary note."

II.

If the radiations in question were negative electrons, as are the cathode rays of the Crookes' tube, and the *beta* rays of radium, they would of course be deflected by a strong magnetic field, but efforts in this direction by Dr. Pegram in the Physical Laboratory of Columbia University, by Dr. Milton Franklin at his own laboratory and by myself, failed to give evidence of any deflection.

E. Wiedemann, in the *Zeitschrift für Elektrochemie*, July 20, 1895, described a new form of radiation to which he gave the name of *Entladungsstrahlen*, and stated that it was not deflectible by the magnet and would not pass through flour-spar which readily transmits the ultra-violet rays. He does not appear to have examined the radiations with the electroscope. It is quite possible therefore that Wiedemann's observations related to the "rays" to which I have here called attention.

Excluding ultra-violet rays and negative electrons, it is, of course, possible that they are positive electrons, such as constitute the Goldstein rays, *i.e.*, the anode rays of the Crookes' tube, and the *alpha* rays of radium; neither of which have heretofore been utilizable for therapeutic purposes. There is another hypothesis, however, that seems to me more probable; namely that they are ions.¹ Ions may be generated in a variety of ways and are always developed at the site of an electric spark. Coincidentally there is developed an area of high pressure that drives the ions at a high velocity into the surrounding air.

In discussing this question Prof. J. J. Thomson says,² that if we have a spark one centimeter long in connection with a condenser of 1,000 cm. capacity the pressure developed will be equal to that of 660 atmospheres (equal to about five tons to the square inch). This pressure, however, diminishes with the distance from the spark according to the law of inverse squares.

When we consider the enormous velocity with which the ions are projected in consequence of the pressure behind them, and the rapidity with which they are developed, it is quite within reason to assume that they will be capable of exerting a considerable influence on tissues that are

¹ The ions of the physicist are not to be confused with the chemical ions resulting from electrolysis.

² *Conduction of Electricity Through Gases*, Cambridge (Eng.), 1903, p. 392.

brought within a centimeter or two of their point of origin, and in the earlier writing¹ I suggested that the reaction following the use of the hyperstatic spark might be due in part to the effects of ions on the tissues. Ultra-violet rays also ionize the air, and to this ionization may be due some of the effects observed after their use.

Since my "preliminary" note was published I have found clinically that the "rays" of which I am speaking do exert a very powerful influence on the skin; and that the reaction is similar in character to that of the X-rays and of radium; and that it appears much more promptly. Like them also it may produce a curative or a de-

Fig. 2.



The author's spark-ionizer (about $\frac{1}{3}$ scale).

structive effect according to the intensity of the spark and the duration of its application.

When the spark is produced between iron electrodes with one or more intervening gaps, the total length of the gaps need not exceed one centimeter. If the lamp be used in connection with a coil and suitable condenser, and an application of about five minutes be made with the sparks about 15 mm. from the tissue, a decided reaction will be obtained in soft morbid epithelial and other degenerating lesions. A similar application for fifteen minutes has resulted at my hands in the sloughing out of a lupus nodule. It is

¹ Radio-Praxis, Medical Record, March 7, 1903.

important, therefore, that care should be used, especially at the beginning of treatment in any given case. Besides by myself these condenser spark radiations have been used by Dr. Robt. Abbe, Dr. Milton Franklin and Dr. W. H. Diefenbach, of this city, and by Dr. J. W. King, of Bradford, Pa., with as they have stated to me highly gratifying results.

The use of X-rays in connection with uterine cancer and some epitheliomatus conditions of the buccal cavity present mechanical difficulties that it is sometimes inconvenient to overcome; while ultra-violet rays have not, so far as I am aware, been employed in these conditions. These mechanical difficulties, however, need not stand in the way of those who desire to employ the ultra-violet plus the electrons or ions (or whatever they may be) in these conditions, as the open spark arranged in the form shown in Fig 2, which I have provisionally called a spark-ionizer, can be readily introduced through a speculum or other suitable shield. The particular form of the appliance, as here shown, can, of course, be modified to suit any special requirement.

Fully aware that ultra-violet rays, as well as the ions are superficial in their action, being absorbed by a very thin stratum of tissue, I have, on more than one occasion, been surprised by the evidences of a deeper influence.

The following recent experiment, however, has apparently furnished the explanation: I exposed a piece of velox paper through a glass negative, and obtained a fully-timed print in about one hundredth of the time that would have been required to get one of similar character with a 32 c.p. incandescent light. As neither the ultra-violet rays nor the ions will go through glass, the action on the photo-paper was due wholly to the luminous rays, which, though greatly inferior in volume to those from the incandescent filament, very greatly surpassed them in intensity. When optically analyzed the entire spectrum from red to violet was exceedingly brilliant.

As the longer wave-lengths of light penetrate the tissues farther than the shorter ones, the cause of the deep reaction of the condenser spark was thus readily explained.¹

We have thus in the condenser spark three forms or types of energy in coincident action, namely, the intense and penetrating luminous rays; the more superficially acting ultra-violet rays; and the furious bombardment by the ions. To this combined action, the terms triradial or triergic may with propriety be applied.

As regards the technic my experience leads me to recommend: (1) If the appliance be used with a coil, a single Leyden jar should be employed, with inner armature connected with one of the secondary terminals, and the outer armature with the other terminal of the secondary of the coil. The lamp is then connected directly to

¹ Contrary to the general opinion, I believe that the results of the Finsen treatment are mainly due to the luminous rays rather than to the ultra-violet.

the secondary by its cords. I prefer a Wehnelt interrupter adjusted to give a current of five to six amperes through the primary of the coil. The armatures should not exceed 40 square inches of foil in each. This is for the three spark lamp. For the one spark "ionizer" a lesser amount of energy is preferable. The first application should never exceed ten minutes. (2) If connected with a static machine use two Leyden jars the armatures of which should each have a foil surface of at least 100 square inches. The outer armatures of the jars should be connected together, and the lamp terminals connected to the pole pieces of the static machine. The first application should not exceed fifteen minutes with the spark from 15 to 20 millimeters from the lesion.

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EXTRA-UTERINE PREGNANCY: ITS DIAGNOSIS. REPORT OF CASES.

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A MERE casual dipping into the contemporaneous literature will serve to convince that ectopic gestations are not of so uncommon occurrence as is the general impression. It is difficult, however, to obtain accurate data as to their frequency and the meager statistical facts occasionally furnished differ widely. Douglas, for instance, quotes Bandl as saying that extra-uterine pregnancy occurred once in every twelve thousand pregnancies, while Price had found it to occur eighty-three times in eight thousand pregnancies. Douglas's own work for fifteen years approximated four cases annually. Williams says that prior to 1876 extra-uterine pregnancy was considered so rare an affection that Henning stated that even the directors of large obstetrical institutions might never encounter a case, and Perry was able to collect only 500 instances from the entire literature. It was only with the gradual development of abdominal surgery that the relative frequency of such pregnancy became recognized. Schrenck, in 1892, collected 610 cases, which had been reported in the preceding five years, and recently many operators have placed on record large series, Kustner having operated upon 105 cases in the course of five years, while Noble encountered extra-uterine pregnancy in three to four per cent. of all his laparotomies. Vineberg reports nine cases that came under his observation in the course of one summer. In a clinic averaging over six hundred gynecological cases a year, it has been my fortune to see three cases of ectopic gestation this past year.

It is doubtful, to say the least, whether it would be possible from the tabulated experiences of one man or set of men to obtain a true idea of the frequency of the condition, owing to failure on the part of the profession in general to recognize it. As Vineberg has well said: "The affection has not met with the same alert-

ness on the part of the profession that appendicitis, for instance, has encountered for some years past." When that same attitude of alertness, of suspicions toward obscure and hitherto little understood menstrual irregularities and pelvic pains, shall prevail, we shall find, as I think we begin already to find, the recorded number of ectopic gestations increasing.

The importance of this attitude of suspicion is emphasized by the history of Vineberg's nine consecutive cases in but two of which was the classical picture of the disease present.

With this idea well fixed in the mind, we may enumerate briefly the symptoms usually held as leading to the diagnosis of ectopic gestation and consider the question of differential diagnosis.

The history of amenorrhea for a month or two accompanied by the usual signs of a normal pregnancy occurring in a woman previously sterile for a number of years; "this amenorrhea being followed by a period of irregular, intermittent bleeding from the genitals, the discharge of a decidua cast from the uterus, and occurrence of occasional severe colicky pains in the lower abdomen, would lead one to the diagnosis of extra-uterine pregnancy; and if upon vaginal examination we should find the uterus slightly enlarged, though not to the size proper to an intra-uterine pregnancy of the period indicated by the history, and further if we should find to one side a fluctuating boggy mass pushing the uterus over to the other side, we should have present all the possible evidence in favor of our diagnosis. When shortly after such an examination we find our patient in a state of collapse, with all the clinical manifestations of internal active hemorrhage, we have been further confirmed in our opinion by the occurrence of intra-peritoneal rupture. But it is precisely these clean-cut unmistakable cases that are of rare occurrence. We must remember in the first place that the symptoms of rupture may be the first to direct our attention to the possibility of the existence of any serious intra-abdominal condition, in fact the woman herself may not previously have been aware of anything amiss. In the presence of such a state of affairs, of course, the question of differential diagnosis is of minor importance, indications for celiotomy being the same no matter what the cause of the intra-peritoneal hemorrhage. In such cases to arrive at a proximate diagnosis we should have to rely in the main upon the previous history. Pelvic examination would yield but little information, the mass, if it had existed, having ruptured and the blood being free in the abdomen.

The history of irregular bleeding following an amenorrhea in a woman presumably pregnant but who had been previously sterile for a number of years leads directly to the consideration of what is probably the most interesting point in the differential diagnosis from early intra-uterine abortion. It will often, in fact usually, be im-

possible to determine from the woman's story the difference between the early abortion and the decidual cast of extra-uterine pregnancy. Both conditions may give rise to a more or less continued or intermittent hemorrhage. In both conditions the uterus may be slightly enlarged. The fact that the patient has been previously sterile or is known to have been the victim of previous pelvic inflammatory trouble, will not lend much weight to the side of tubal pregnancy, as against intra-uterine abortion, nor would the opposite history exclude the extra-uterine gestation. We may be helped by a history of recurrent pains, whether sharp and lancinating, or bearing, boring or dull and throbbing, more especially an account of one or more spells of faintness indicating repeated partial ruptures. But of greatest importance is the vaginal examination. We must not content ourselves with the probable diagnosis of early abortion when presented with a history such as I have tried to outline, but should make careful pelvic examinations, always, of course, with due precautions of cleanliness, and determine for ourselves the true state of affairs. Remember that we may have no pains, no signs of rupture and remember that it is just in this quiescent state that we may hope to be of the greatest assistance. Even upon examination we may find the diagnosis still problematical. If we find a fluctuating mass in the broad ligament to one side we are justified with such a history to make a diagnosis.

Illustrative Case I.—Lizzie Bolden, colored, age twenty-six years. Admitted to the Charity Hospital September 27, 1903. Well nourished. Puberty established at sixteen. Three children. Oldest nine years, youngest one year and a half. One miscarriage five years ago. Has had pain in both groins and back ever since this miscarriage. Previous to two months ago menstruation was perfectly regular, lasting three days at each period. For past two months has been bleeding intermittently for a day or two at a time. Vaginal examination revealed a small fluctuating tumor about an inch and a half in diameter to the right of the uterus. Tumor was freely movable and stood in the same relation to the uterus as the tube would. The right ovary was easily palpated and found normal. Left adnexa normal. Uterus normal in size. Patient gave a history of having passed a decidual cast. Here the history of the patient alone would have led us rather to the diagnosis of very early abortion or of hemorrhagic endometritis. Pelvic examination enables us to localize the trouble in the tube, but left us in doubt as to its precise nature. Salpingitis might very well accord with the history and account for the uterine hemorrhage. However, the tube was freely movable and the ovary was normal in size and mobility—all presumptive evidence against inflammatory trouble. Armed with the suspicion on which I have endeavored to lay stress, I ventured upon a probable diagnosis of extra-uterine tubal gestation.

Whether tubal gestation or salpingitis with that amount of fluid accumulation within the tube, the condition called for operative interference. Upon opening the abdomen, October 1, 1903, I found the right tube distended to the size already mentioned, adherent to a coil of intestine not easily separated. After ablation the tube was opened and found to contain a fetus of about six weeks. Patient made an uneventful recovery.

Just here I may remark upon the relative safety of an exploratory laparotomy as contrasted with the very great danger of a curettage in such cases as this. I would not counsel rash invasion of the peritoneum, but exploratory laparotomy should be an operation without mortality. On the other hand, what must have been, in such a case as this, the calamitous consequence of a curettage, that operation so simple and supposedly so devoid of risk, undertaken for the cure of a supposed endometritis, possibly dependent upon the salpingitis? Unavoidable rupture of the pregnant tube, internal hemorrhage and death of the woman.

From normal pregnancy there should be no differentiating the abnormal gestation. The soft fluctuating body of the uterus plainly continuous with the cervix can hardly be confused with the tube. Small ovarian cysts with torsion of the pedicle may simulate ectopic gestation in symptoms both subjective and objective. Douglas points out that the points of difference here would be: (1) Signs of pregnancy; (2) amenorrhea; (3) passing of decidual membrane in the history of an ectopic; (4) upon an examination we should find the uterus drawn over to the same side by the taut pedicle of the cyst, whereas that organ would be displaced invariably to the opposite side by the pregnant tube.

But not only in the early (unruptured) stage is the diagnosis of ectopic gestation difficult. Even when the pregnancy has continued to term and the patient has withstood the, it may be, repeated ruptures of the gestation sac with limited hemorrhage and the dangers of missed labor, and even come into the depths of sepsis, the diagnosis is obscure and perhaps impossible. I may best indicate this to you by the relation of

Case II.—Ollie Wilson, colored, aged twenty-nine years. Admitted to Charity Hospital April 14, 1903. Personal history: Began to menstruate at thirteen years. Regular periods four to five days, slightly painful. One child, three years ago. No miscarriages. Present illness began eleven months before admission. Pains in hypogastrium, violent, attended with vomiting and prostration severe enough to cause patient to go to bed for some time. Since that time has noticed gradual development of tumor in hypogastrium. Has had severe attack of vomiting and severe abdominal pains. Menstruates regularly, but periods last from seven to nine days. No history of menstrual cessation prior to above symptoms. Occasional chills followed by fever. Fever often without chills preceding it.

Status præsens.—Septic appearance marked; septic temperature. Tumor soft and fluctuating, filling hypogastric zone and rising midway between umbilicus and ensiform cartilage. Extremely painful and tender. Chill twenty-four hours after admission. Vomits persistently since that time. Pulse hard and rapid, without sustained volume. Vaginal examination shows tumor apparently connected directly to uterus. Difficult to define accurately limits of tumor owing to pain. Cervix hard; os small. Adnexa not palpable. Condition is one of a suppurating encysted collection. History is suggestive of extra-uterine pregnancy. Probable diagnosis prior to operation: Suppurating ovarian or dermoid cyst.

Operation.—Upon opening the abdomen, a large fluctuating mass, adherent to intestines and in part to abdominal parietes above, presented itself through the incision. Aspiration showed this to contain a slightly greenish-yellow non-purulent watery fluid. The cyst was incised and contents allowed egress. Posteriorly and a little to the left of this was another cyst, aspiration of which revealed the presence of a greenish, serous and slightly blood-streaked pus. Attempts to free the cyst from surrounding adhesions resulted in its rupture. It was found on exploration of its cavity, to contain fetus, apparently full-term, showing conditions of beginning maceration. Placenta well formed. Fetus removed after ligation of cord. An acute exudative peritonitis was present involving the entire peritoneal surface, both parietal and visceral, from pelvis to diaphragm. Exudate was removed with sponges and the abdomen and pelvis flushed with normal saline solution. No attempt was made to remove the placenta. Gauze drains were passed up to the diaphragm and down into the pelvis to those points indicating the severest local peritoneal infection, the end of these drains being brought out through the abdominal wound. This was sutured to the abdominal wall and the sac cavity was filled with iodoform gauze. The abdominal wound was partially closed with interrupted through-and-through silkworm sutures. Death eight hours after operation from post-operative shock and effects of toxemia prior to operation. No post mortem. This patient was profoundly septic upon admission and her very grave condition demanding immediate operative interference was plainly due to some collection of pus within the cyst. What the nature of that cyst originally was could not be made clear without the operation urgently demanded for the relief of the condition. But while confessing one's inability to make this positive diagnosis at this stage, must not our thoughts necessarily come back to the question: Could not the diagnosis have been made earlier, before the woman had become septic and when the chances for recovery would have been enormously increased? Was not the history of repeated pains and prostration with the progressive growth of a fluctuating

tumor sufficient reason months before to arouse the suspicion of the attending physician and to cause him even in the absence of a positive diagnosis to insist upon an exploratory operation and an inspection of the pelvic condition? Did not the history at least call for a careful bimanual examination early in the disease and would not this have revealed the presence of what was then a small fluctuating tumor. This latter would have demanded surgical procedure.

I end as I began. I believe:

1. This disease is a far more frequent one than most of us now believe it to be.

2. By maintaining an attitude of alertness and by carefully investigating all conditions of menstrual irregularities and colicky pains, we shall find ourselves warranted in establishing an accurate diagnosis and saving the lives of some patients who would otherwise perish.

3. That when the diagnosis is obscure in the presence of a boggy or fluctuating mass to either side of the uterus, we are justified in doing an exploratory operation either through the abdomen or the vaginal fornix.

PANCREATITIS.

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THE pancreas, the most sequestered organ in the abdomen, has at last yielded up in part the secrets of its obscure and incorrigible inflammations: The frequency with which it is associated and indubitably caused by gall-stones makes it a more easily comprehensible and less forbidding disease to the surgeon. The violence of onset and the gravity of the symptoms render it of great importance to the diagnostician. The intricacy of its physiology and the uniqueness of its varied tissue changes open an inviting field to the pathologist, while the unraveling of its complex phenomena and etiology make it at this time of peculiar interest to the pure scientist.

Inflammations of the pancreas were formerly supposed to be very rare, but the result of recent investigations and the accumulated work of clinicians have shown it to be much more frequent than it was supposed to be, and, moreover, certain curable forms may remain undiagnosed and leave no trace behind.

Acute Pancreatitis.—Fitz, in his original classical description, divided pancreatitis into hemorrhagic, gangrenous, and suppurative. This is a most accurate pathological division, and in some cases the variety can be designated, but usually they shade into each other, and thus appear as progressive stages of the same process with a common cause. The clinical classification of Robson, therefore, into acute, subacute and chronic would seem to be the most desirable.

It can occur, therefore, with or without hemorrhage, suppuration, gangrene, or fat necrosis.

Etiology.—The causation of this disease, ever since it has been recognized with any degree of frequency, has been shrouded in mystery. Many theories were offered, and the explanations required further explanation. Like most things, when the true explanation is found, it turns out to be very simple. Mr. Mayo Robson, in connection with his gall-stone work, observed cases of induration of the head of the pancreas with gallstones in the common duct. It had been noticed by pathologists that at necropsy pus can usually be expressed from the duct of Wirsung in these cases.

Robson has drawn our attention to the obvious fact that a stone obstructing the common duct at the ampulla of Vater must necessarily obstruct the duct of Wirsung, and also that inflammation of the bile duct as the result of cholelithiasis is perhaps the most prominent etiological factor in the chronic, indurative, interstitial, or cirrhotic form.

Kennan, in 1896, Körte and Lancereaux, in 1898, and Oser observed this coincidence; but Robson, who saw his first case in 1892, seemed to be the first to grasp the comprehensiveness of the occurrence and to bring it succinctly and forcibly to the attention of the profession in 1900.

The anatomy and mechanism of this process may be briefly quoted from Opie as follows:

"The orifice of the diverticulum of Vater constitutes the narrowest part of the bile channel, and here small calculi not infrequently become impacted. A small stone lodged in the diverticulum may occlude its duodenal orifice, and, too small to completely fill the diverticulum and occlude the two ducts that enter it, may convert the latter into a single closed channel along which bile may be forced by the gall-bladder. Bile thus injected into the pancreatic duct causes, as will be subsequently shown, the condition known as acute hemorrhagic pancreatitis. This lesion does not commonly follow the expulsion of a gall-stone from the common duct. For its production it is necessary that the diverticulum of Vater be capacious, with a length at least greater than the diameter of its duodenal orifice."

As bearing upon the possibilities of the entrance of bile into the pancreas it may be mentioned that in dogs death has been caused in twenty-four hours by the injection of 5 c.c. of bile into the pancreatic duct.

Opie, supported by Welch's investigations, claims that the bacteriological findings have been so variable and inconstant that they do not enter into the etiological factorage, but are merely secondary invaders of injured tissue. He has placed the relationship between gall-stone in the ampulla of Vater and acute pancreatitis upon the same fortified position as Robson did between the common duct stone and chronic pancreatitis. He had the previous observations of others and his own careful study of the post mortem on Osler's

case, operated by Bloodgood, of acute hemorrhagic pancreatitis followed by death, and finding a small stone at the duodenal papilla.

To this carefully worked-out case he has added the reports of seven others in which the stone was actually acting as a ball, occluding the exit of both ducts into the duodenum and allowing the bile to flow directly into the pancreatic duct. He properly infers that in many cases the stone may be temporarily lodged long enough to cause damage to the pancreas, and then escape, leaving no actual evidence of its former impaction. He also tabulates forty-one cases of acute pancreatitis with cholelithiasis, certainly enough to establish an undoubted causal relationship and food enough for further theorizing as to the rôle of infection associated with gallstones and productive of pancreatitis.

Robson and Moynihan contend in their monograph that the immediate and essential cause of pancreatitis is bacterial invasion, but mentions as exciting causes biliary and pancreatic calculi, trauma, gastro-duodenitis, gastric and duodenal ulcer, and carcinoma, and certain infectious diseases, such as typhoid fever, influenza, and mumps. In some cases occurring suddenly in perfectly healthy persons the exact cause cannot be designated.

Fat Necrosis.—Aside from the usual pathological changes which take place in gangrenous and suppurative inflammations, the distinctive tissue change in this disease is fat necrosis. This occurs when, as the result of obstruction of the excretory duct, the fat-splitting ferment of the pancreatic juice penetrates into the tissues about the organ.

The obstruction is gradual in chronic pancreatitis, and the penetration of the pancreatic juice is so slow that minute foci occur. In acute hemorrhagic pancreatitis or its later stages, gangrenous pancreatitis, the fat necrosis is more widely disseminated. The retrojection of bile into the pancreatic duct, causing necrosis of the parenchyma of the gland, dams back the pancreatic juice that is present, thus causing fat necrosis of the fatty tissue surrounding the pancreas. The fat is split into its component fatty acids and glycerin. The latter is absorbed, and the former unites with the lime salt to form yellowish-white, non-elevated, opaque spots about the size of a millet seed. They resemble miliary tubercles or carcinomatous nodules, but occurring sometimes in the subcutaneous fat and regularly in the subperitoneal fat as well as the omentum, one should be able to recognize them by this means as well as by their brittle feeling, and recognize that they point almost as unerringly to disease of the pancreas as jaundice does to disease of the liver.

Symptoms.—Acute pancreatitis is characterized by sudden onset of severe agonizing pain in the upper abdomen, producing syncope or collapse, recurring in paroxysms and aggravated by attempted motion. The pain is described as most excruciating, almost invariably requiring

morphine for its relief. Immediately following the pain, tenderness, well-marked between umbilicus and ensiform appendix, makes its appearance.

Distention of the upper abdominal zone succeeds the pains, becoming general late in the disease. Cyanosis of face and abdomen has been noted in a number of cases, and in one was the most suggestive symptom.

Usually vomiting is an initial and most annoying symptom, first of food and then of bile, and sometimes blood. Though it is not always present it may be very severe, and increases the pain, thus adding greatly to the distress of the patient.

Slight jaundice from coexisting catarrh of the bile tract may be present. Facies present a pinched and anxious expression, and may be Hippocratic in its depiction of suffering and impending death.

The pancreas is generally enlarged, but the great pain, exquisite sensitiveness, and marked distention preclude an accurate palpation of the organ in its deep-seated position.

Glycosuria is rare, because, as demonstrated by Opie, the disease primarily attacks the excretory apparatus and does not affect the islands of Langerhans, which preside over the glycosuric function. In only two of forty-one cases of hemorrhagic pancreatitis, and in only three out of forty cases of gangrenous pancreatitis collected by Körte, was sugar present.

Effort has been made to recognize clinically the fat-splitting ferment in the urine by chemical test. Ethyl butyrate, carefully purified when acted upon by a fat-splitting ferment, is decomposed with the formation of butyric acid, which gives an acid reaction to the solution.

Ascites may result from pressure on the portal vein, from an induration or abscess in the head of the gland, as in a case reported by Musser. Most victims of this disease are markedly fat. The pulse is rapid and thready. Temperature is variable and not an accurate index of the severity of the condition. Hiccough sometimes occurs, and is very distressing and sometimes uncontrollable. Delirium may appear in the later stages and be quite unmanageable. Death from collapse often occurs in from two to five days, though the patient may survive longer in less acute case, and recovery sometimes follows.

Diagnosis.—Symptoms of peritonitis in the upper abdomen are suggestive of pancreatitis. Intestinal obstruction is very closely simulated. Several of the reported cases were operated on with that diagnosis, and the real condition was ascertained only after obstruction was fruitlessly searched for. Fitz's rule, quoted by Robson, is as follows:

"Acute pancreatitis is to be suspected when a previously healthy person or sufferer from occasional attacks of indigestion is suddenly seized with the violent pain in the epigastrium, followed by vomiting and collapse, and in the course of twenty-four hours by a circumscribed epigastric

swelling, tympanitic or resistant, with slight rise of temperature."

When confronted with a case presenting the foregoing syndrome, one has to discriminate intestinal obstruction, biliary colic, cholecystitis, intestinal perforation, and gangrenous appendicitis.

In intestinal obstruction the distention will usually be greater and more general; in pancreatitis it is frequently limited to the epigastrium. In intestinal obstruction the peristaltic patterns can often be seen, and the waves may be heard by auscultation. The obstipation is absolute, whereas in pancreatitis the bowels may move, or at least gas is often expelled. In intestinal obstruction the vomiting finally becomes stercoraceous. Collapse is early in pancreatitis and late in intestinal obstruction. Temperature is commonly present in the beginning of pancreatitis. Its presence in the initiatory stage eliminates intestinal obstruction. The pain is lower down in intestinal obstruction and comes on more in paroxysms. Intestinal obstruction may complicate pancreatitis by strangulation or compression of the duodenum. The final diagnostic and curative measure in both is abdominal section. Fat necrosis is pathognomonic of pancreatitis when present.

Pain in pancreatitis is similar to a severe attack of biliary colic, but more intense. In biliary colic it is situated to the right of the median line and extends upward under the right shoulder. In pancreatitis it is situated in the median line and extends to the left.

In phlegmonous cholecystitis, or rupture of the gall-bladder or ducts, the acute symptoms are often preceded by tumefaction or tenderness at the tip of the ninth costal cartilage. After peritonitis ensues from any cause the symptoms of the original disease are lost in the all-too-well-known and fatal complication.

Intestinal perforation (stomach or duodenum) will present a preceding history of the more or less classical story of these affections, and the escape of gas and the advent of peritonitis after the perforation is generally attended with an absence of liver dullness. Moreover, the vomiting which is so persistent in pancreatitis, usually subsides in perforation of the upper alimentary canal, until consecutive peritonitis is declared by its return.

In perforative appendicitis, while the initial pain may be about the umbilicus, the localization of pain, tenderness, rigidity, and perhaps swelling in the right iliac fossa, render differentiation easier than perforative lesions in the upper abdominal quadrant.

Treatment.—While the futility of medicinal treatment is recognized the excessive pain requires relief, the collapse demands stimulation, and the vomiting can be ameliorated by gastric lavage.

Surgical intervention is precluded in the stage of collapse. The disease, from the indefiniteness of the symptoms, is either not suspected or the

symptoms of obstruction or perforation seem to be dominant. Should operation be undertaken upon this ground, or even upon a correct diagnosis, as urged by Mikulicz, fat necrosis will at once clinch the diagnosis. The organ may be reached through the gastrohepatic or gastrocolic omentum, or by the posterior approach at the costo-vertebral angle.

Mikulicz definitely advises incision of the tense-walled sac, that often feels, as described by Mayo in his successful case, "like a pudding in a tight sac." An incision four inches long and three-quarters of an inch deep in the pancreas was made by Porter, followed by drainage and recovery. A large gauze drain surrounded with gutta-percha tissue is the best anterior drainage. In the gangrenous or suppurative form posterior drainage through incision in the left costo-vertebral angle is advised.

Roswell Park likens prompt operation in this condition to early interference in fulminating appendicitis. Mikulicz compares severe cases of acute hemorrhagic pancreatitis to an acute phlegmon in which, on account of its peculiar consistency and secretion, an unusually severe course is run. He urges incision and drainage of toxic contents, thereby escaping sepsis and further destruction of the gland.

Subacute Pancreatitis.—It is well known that some cases, while presenting a sudden onset, run a less virulent course and survive a longer time. Some have been submitted to operation, and after the diagnosis was made intra-abdominally, very little or nothing was done, ending in recovery.

Robson reserves this classification of subacute pancreatitis for such cases, without marked collapse, less severe and protracted vomiting, and without such rapid and well-marked epigastric swelling. The tenderness is much less, and distention being not so great, the enlarged pancreas may be palpated, especially under an anesthetic.

Blood or pus may appear in the fetid diarrhea consecutive to the initial constipation. A septic temperature with rigors often occurs, and then abates, with apparent general improvement until a recurrence of acute symptoms takes place, with great weakness and loss of weight, and finally death occurs. These cases sometimes terminate in suppuration of the pancreas of pancreatic abscess, which may burrow, according to Robson (1) behind the stomach; (2) into either loin; (3) under diaphragm (subphrenic abscess); (4) along the psoas muscle (subperitoneal iliac abscess); (5) under peritoneum into left broad ligament.

Chiari reports two cases where the portion of a necrotic pancreas was passed per anum with recovery. This termination, even in pus cases, is, however, not always so favorable, and death usually takes place from prolonged sepsis of imperfect drainage.

This type of the disease being comparatively mild does not appear to demand surgical intervention or other heroic treatment so urgently as

the acute form, and, suppuration occurring, the surgical indications become clear, and incision may be made over the pus collection for drainage. After a complete examination of the relations of the abscess cavity, if found to be still retroperitoneal, posterior incision at the right or left costo-vertebral angle may be made, as suggested by Robson. The whole hand may be introduced, pus collections broken up, and efficient drainage instituted without danger of peritoneal contamination. Robson and Moynihan reported three successes out of five cases of suppurative pancreatitis.

Chronic (Interstitial) Pancreatitis.—This is divided about equally between the sexes. Two-thirds of the cases occur between forty and sixty. It is usually the result of obstruction of (a) pancreatic calculi in the duct of Wirsung; (b) gall-stones in the common duct or ampulla of Vater; (c) neoplasms, usually malignant, obstructing the outflow of the pancreatic fluid.

The pancreas is easily obstructed, because the accessory duct joins the main duct within the gland in 90 per cent., or if, as occasionally, it enters the duodenum independently, the orifice is usually so small that it is unable to allow of free exit if the main duct is occluded.

Duct obstruction constitutes a propitious condition for the invasion of bacteria, which is believed by some to be the essential cause, and the access of the bile, if it does not give rise to rapid necrosis, causes a chronic hyperplastic inflammation.

In three cases of chronic (interstitial) pancreatitis detected by the stony indurated feel of the pancreas during operation for gall-stones, Riedel feared malignancy; but two of the cases recovered and remained well for a number of years, thus disproving the idea of malignancy, and the diagnosis in the third was confirmed after death. Doubtless many cases have been denied operative relief, even when the surgeon was in the abdomen, upon the supposition of the indurated head of the pancreas being distinctly malignant.

Extension of infection from inflammation of the duodenum and bile tracts may be operative in its production. Moynihan reports a case of operation where chronic pancreatitis of stony hardness was found, due to infection with typhoid bacilli nearly two years after the fever. The gall-bladder was drained, the bacilli were found in the discharge for weeks, and then ceased. The boy recovered.

Chronic interstitial pancreatitis may also occur from general or local tuberculosis. It results from excessive use of alcohol, just as cirrhosis of the liver does, and is said to be associated with the latter in one-quarter of the cases.

The chronic changes as the result of interstitial effusion gradually enlarge the pancreas, which presses against the common duct, giving the usual jaundice.

Symptoms.—In patients with stomach pain, chronic jaundice, and emaciation, give the patient the benefit of the doubt, and consider chronic pancreatitis as well as cancer and gall-stones. The patient is often a dyspeptic or gall-stone sufferer. Exacerbations of epigastric pain occur, and may be replaced by a deep-seated ache. Nausea and vomiting alternate with anorexia, belching, etc. Finally, jaundice makes its appearance with attendant putty stools. Emaciation follows, and the cachexia of malignancy is simulated. Marasmus closes the scene.

In the diagnosis midepigastric tenderness serves to distinguish pancreatitis from cholangitis and cholecystitis. Undigested fibers of meat may appear in the stools. Lipura and glycosuria are late symptoms.

It is not so important to discriminate between gall-stones and chronic pancreatitis, as the treatment of both is the same. In cancer of the pancreas the secondary anemia and leucocytoses may distinguish it, and the cachexia and painless distention of the gall-bladder is corroborative. Exploratory section is justifiable in doubtful cases.

In obstruction to the outflow of pancreatic juice undigested meat fibers may be found in the feces after a meat diet. Salol, when administered in large doses, should be split into its components—carbolic acid and salicin—by the pancreatic juice, and their absence in the urine is an accurate test.

The Mayos have reported operations upon seven cases, all recovering; four were treated by cholecystostomy, and three by cholecystenterostomy, twice to the transverse colon and once to the duodenum, the results being as good where the colon was used as the duodenum.

In the treatment, appropriate operations on the bile tracts to free them from obstruction, followed by drainage, is the indication. The results have been quite satisfactory. Robson lost only one case out of twenty-two operations, and Mikulicz collected thirty-six cases with five deaths.

LAUNDRY HYGIENE.

BY IRA S. WILE, M.D.,

OF NEW YORK.

"CLEANLINESS is near akin to godliness." Wesley's dictum daily grows in grandeur and strength. Cleanliness is now one of the main supports of organized communities and a most prominent factor in preserving them from disease and decay.

From organizations of men for self-betterment, for mutual protection and development, have arisen our great systems of manufactories. From cooperation and division of labor have come the trades and professions. Regard for the general health has directed the management of industries along lines of safety so that no portion of a community need suffer unnecessarily because of industrial progress. There has been evolved a

higher industrial morale and more rigid sanitation, based upon the most searching examination of the effect of each industry upon the community as a whole and upon the workers as a class. Exposure to undue congestion, to filth, to disease, has been gradually lessened. The factory laws and tenement inspections evince the lively interest taken by the State in preserving the health of the great mass of workers. Cleanliness has become an index of industrial hygiene. The state of civilization may indeed be gauged by the soap-bill of a nation.

To keep pace with the gross advancement individuals have had to give especial attention to the problems of personal hygiene. To meet the complicated conditions arising from the division of labor, it has been necessary to support a class with the principal duty of providing facilities for the proper cleansing of articles of attire and household use. The laundry system has grown up to relieve the needs of the cleanly and satisfy the demand for hygienic apparel, etc.

Disregarding the general form of organization, it is not unfair to ask if laundries in themselves are hygienic. All sorts of clothing, bedding, towels, etc., are collected from all sorts of people with all sorts of diseases. This mass of soiled, often polluted and infected, material is collected, assorted, marked, carried hither and thither by employees before being subjected to the heat and chemical process incident to thorough laundering. During the manipulation preceding sterilization, the soiled articles are sources of danger to the health of the various employees handling them. In the processes of drying, ironing, re-assorting, checking and wrapping, the employees become possible sources of infection to the owners of the various articles passing through their hands. While this is equally true for machine and hand laundries, in the latter the dangers to either employee or patron are increased because of increased handling. As an offset, however, is the lessened amount of infected material handled at hand laundries. Bearing these two aspects in mind it seemed not unnatural to enquire as to the precautions taken by laundries to protect their employees from infection and prevent the transmission of any disease from employee to patron. To get a little light on the question a personal letter was sent to every laundry in the city of Rochester, N. Y., briefly stating the information desired by the writer and asking for answers to five questions enclosed on a separate sheet of paper. Names were not to be signed to the replies. No evidence of good faith was requested beyond the courtesy of a response. The questions submitted were as follows:

1. What precautions, if any, do you use to prevent infection of employees in handling soiled materials from time of collection to delivery?
2. Do you have much illness among employees? If so, of what character?
3. Do you know of any specific diseases which have been spread? If so, what ones?

4. What means do you have of protection of patrons from diseases of employees?

5. Is tuberculosis common among employees? Among diseases to be considered I should like to suggest as examples, typhoid, scarlet fever, smallpox, syphilis, diphtheria, gonorrhea, infected fingers, inflamed eyes, etc.

The answers vary in methods of expression, but are practically uniform as to statement of existing conditions in the trade.

1. No especial precautions are taken to prevent infection of employees. Particularly filthy materials are not accepted, or, if accidentally received, are not laundered. Articles of wearing apparel, towels, sheets, pillow cases, are not received from places where contagious diseases are known to exist. "We never call at a home where they have a sign put up by the Board of Health." The marking room is kept as clean as possible and thoroughly scrubbed at least once a week.

2. The variations in answers were from plain "No" to the interesting statement "Girls become stronger and gain weight in the laundry." As far as could be learned illness is no more frequent than in any other business establishment, employing large numbers of workers. The ailments are merely of ordinary types and in no way dependent upon the vocation.

3. No specific cases of contagion have been found due to or even attributed to handling infected garments, underwear, sheets, towels, etc. Among the employees, there does not appear to be any particular susceptibility to the various infective micro-organisms. One laundryman was expressly explicit: "We have not had one case of contagious disease in our place since January 3, 1880, when I first entered the laundry and we handle tons of goods every week." This statement is probably a little more enthusiastic than accurate. It does emphasize, however, the comparative freedom from contagion of those handling the soiled clothes of a city.

4. From the answers as to means of protecting patrons, several are worthy of attention. As a matter of fact, no systematic, intentional protection to patrons is deemed necessary. Exposure to heat and chemicals along with mechanical agitation destroys the hardiest of bacteria. During the transition from soiled to clean clothes contagion is abolished.

From the diseases of employees no more sufficient protection to patrons can be desired than that gained during the laundering process. That steam, lime, potassium permanganate, oxalic acid, sulphurous acid and numerous other chemicals employed afford almost complete sterilization cannot be denied. Some concerns stated that they refuse to employ girls appearing or known to be unhealthy. It is not strange that one indignant soul should write: "We have yet to hear of the first instance where disease was transmitted from employees to customers." That is more readily believed than the value of another man's

admission that he used hygienic soap to wash the clothes. Oh, Hygiea! how many crimes are committed in thy name!

5. Tuberculosis is no more common among laundry employees than among the workers in any modern, regularly inspected, hygienic, light, airy factory. The moist atmosphere, the frequent scrubblings and lessened dust, tend to keep the omnipresent *Bacillus tuberculosis* in marked subjection. The suggestion of one scientist was thankfully received: "Starching is the best employment for consumptives." Possibly laundries thus possess in starching a beneficent prophylactic measure.

This résumé of the answers to my queries may be of interest to others. It is undeniable that with all the disease germs, known and unknown, which are daily taken to the laundries, little is heard of disease being spread through their medium. My answers are based merely upon established public laundries and not upon an investigation of laundresses who "take in washing" or yield their services at the homes of their patrons.

How do the statements quoted correspond with the facts as observed and recorded by medical workers?

In 1877 the *Lancet* appointed a commission to investigate the laundry system of the time with a view to ascertaining the dangers of disseminating disease through the system then in vogue. A few instances were found where disease had been spread among the families of laundresses and those of their patrons. Because soiled linen was taken to the homes of the laundresses, the danger therefrom was pronounced imminent. Following the report of the *Lancet* Commission, large public laundries were instituted to secure hygienic handling of soiled linen.

From the health laws of England we learn that the hours of labor are restricted to sixty hours per week for women and thirty hours per week for children; the temperature of the ironing rooms must be regulated; ventilation and carrying off of steam from the wash house is obligatory; clean floors and general cleanliness is demanded. This is the present extent of the English laws protecting the health of laundry workers.

In 1896, in the Council of Paris, discussion arose concerning the risk of the spread of infectious fevers through laundries. A commission, with Dechamps at the head, was appointed to investigate the subject. It was recognized that public laundries and municipal disinfecting plants could handle satisfactorily the soiled linens from contagious cases providing notification of the Health Bureau was demanded. The community was unprotected, however, when the contagious disease was unrecognized or belonged to the category of unreportable disease. It was not necessary, nor is it to-day, to report venereal diseases, purulent local infections, dysenteries, tuberculosis, etc. Linen from cases of this nature was

regarded as a source of public danger. The intelligent report advised sealed sacks for transportation of soiled linen to laundries and disinfection before sorting and especial attention to pus or blood-stained articles.

Abbot, discussing the dangers from hospital laundries, urges immediate, moist disinfection of dirty linen. He mentions the danger of spreading disease through dust from dry sputum, blood, pus, feces, etc.

Viola and Morello have shown the high bacterial content of soiled linen and their resistance to weak disinfectants. From their work it is apparent that disinfection should be obligatory before many persons are permitted to handle the disease-laden materials.

In "Risks and Dangers of Various Occupations," Parry does not include laundry work as one subjecting the worker to any particular liability to disease. Dammer refers to the frequency of bronchitis and the diseases of women among laundresses. Arlidge carefully analyzes the work of laundries and attributes the main ailments of laundry workers to the character of their work. He mentions "exposure to steam, long immersion of hands and forearms in very hot alkaline and soapy water, prolonged standing and considerable labor falling on trunk and upper extremities." Little is said of the danger of infection from handling the soiled infected linen. The merest suggestion exists in his reference to the frequency of "erysipelas, onychia and festering sores." Bronchitis is prevalent because of the inhalation of steam, the sudden changes of temperature incident to going to and from the hot steaming washroom and the cooler drying room. No especial stress is laid upon the possibilities of tuberculosis infection from sorting dry, bacilli-laden handkerchiefs, towels, sheets, etc. He quotes an unnamed writer (1891) who gave, as the results of his investigations at Brompton Consumption Hospital, the report that for two and one-half years, two and one-half per cent. of the patients admitted were laundresses.

Dechamps reported that tuberculosis was uncommon among washerwomen. In 1902, the report of the Metropolitan Hospital of New York City did not show a laundress in its statistics of occupations of tuberculosis patients. In a symposium on the "Relations of Phthisis to Factory and Workshop Conditions" (*British Medical Journal*, 1902), due consideration was given to the prevalence of tuberculosis among laundresses. English institutions are discussed and the predisposing causes, mentioned as existent in England are not applicable to this country. Commonness of intemperance and "beer lunches" among laundry workers is not true in America. Much force is given Brouardel's statement that alcoholism predisposes to tuberculosis. The danger to sorters from dried tuberculous material is, however, properly recognized.

In the statistics of Wandsworth and Clapham Union Infirmary, drawing its patients largely

from laundresses, Miss Deane reports that, during 1899 and 1900, 8.7 per cent. of laundresses admitted had tuberculosis as against 5.3 per cent. among all others admitted. For seven and one-half years preceding 1900, 9.68 per cent. of laundresses had tuberculosis while only 5.69 per cent. among others actively employed and 7.02 per cent. of the unemployed patients were tuberculous. Isleworth Infirmary gave 10.9 per cent. for tuberculosis among laundresses and 4.5 per cent. for non-laundresses.

To get a few medical figures I have taken the reports of St. Francis Hospital, 1903; Presbyterian Hospital, 1903; Mount Sinai Hospital, 1903; German Hospital, 1899; Methodist Episcopal Hospital, Phila., 1899.

The accompanying table shows the total number of cases and the percentage of laundry workers to the total number. For comparison, a few other vocations receive slight notice.

	1	2	3	4	5	Total.
Total cases.	2,301	2,912	3,322	769	3,091	12,395
Percent- age, Laun- dry work- ers.	1.0	1.5	0.15	0.3	0.35	0.69
Laundresses	19	40	3	1	11	....
Laundry- men.	4	5	2	1	....	....
Clergymen	17	7	....	15	....	....
Factory girls.	13	17	....	....	....	....
Clerks	55	93	76	16	85	....
Dressm'k'rs.	35	....	....	....	....	....
Tailors. ....	....	....	122	....	84	....
Tailoresses. ....	....	....	34	....	....	....
Barbers. ....	....	....	....	....	15	....
Salesmen. ....	....	....	....	....	27	....
Salesw m'n. ....	....	....	....	....	2	....

I regard these and similar statistics as of very little value, wherefore their fewness. They afford no basis for medical reasoning. As a source of information regarding relation of occupation to health they are useless. They fail to differentiate medical from surgical cases. They do not show if a patient's presence in hospital was due to disease or injury contracted during period of employment or idleness. The effect of occupation is lost in cases of married women who are for the most part registered as housewives. It is apparent that a laundress may marry and die, for example, of a tuberculosis whose origin dated to the days she sorted linen. The term laundress is too general to give reliable information. It covers the "day-out washerwoman," the worker in a hand laundry, the attendant at a large machine laundry. It fails to include the very numerous handlers, sorters, wrappers, who may give their occupations as clerks or even factory girls. The drivers who first handle the soiled linen are wholly ignored. Aldridge rightly noted the difference in the influence of environment. On the one hand, there is the laundress who works at the house of the wealthy, the poor woman who takes her wash home and, on the other hand, the

girl who goes to work in a laundry. The conditions under which the same general work is done vary vastly in hygienic import.

The source of the statistics must also be considered. One hospital draws more largely from one sort of types, class, race, workers, than another. For example, 3 had no clergymen while 1 had 17; 3 had five laundry workers and 2 had 45.

The Isleworth Infirmary was chosen for figures on tuberculosis because laundresses were particularly frequent as patients. If we could get the sum total of all hospitals, with a finely analyzed system of occupational statistics, figures might be more valuable. The number of patients in any one or number of hospitals should be compared also with the estimated number of workers, in that particular trade or profession, living in the community from which the hospital draws its patients. This is open to objection, however, because the mere number of patients of a class in hospitals presents little information regarding health of the occupation. For instance, a fire might send 25 laundresses to various hospitals. The increase of laundresses in the occupation statistics might give unmeant testimony to a health statistician unacquainted with the catastrophe swelling the per cent. list without leaving a trace of the real cause.

These various criticisms of my quoted figures demonstrate the hopelessness of ascertaining from medical sources the dangers to laundresses from handling soiled linen. Until some other facts and figures are available, it appears necessary to coincide with the opinions expressed by the laundrymen themselves.

Laundering appears to be an efficient hygienic method of promoting cleanliness without marked danger to patron and with comparative safety for the employee.

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Dr. Frazier Elected to Episcopal Hospital.—Dr. Charles H. Frazier, Dean of the Medical Department of the University of Pennsylvania, has been elected to the surgical staff of the Episcopal Hospital. He takes the place made vacant by the resignation of Dr. R. H. Harte. The votes for Dr. Frazier and Dr. James P. Hutchinson were so close there is talk of increasing the staff from four to five and appointing Dr. Hutchinson to the extra position.

SOME REMARKS ON DIPHTHERIA BACILLI.

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DIPHTHERIA bacilli have been classified according to their size into long, short, and medium bacilli. As a general rule, the long variety is the most virulent. The majority of later observers have classified them according to the manner in which they stain with Löffler's blue, into granular, barred and solid forms; the granular forms being the most characteristic.

Drs. Westbrook, Wilson and McDaniel, of the Laboratory of the State Board of Health of Minnesota, made an extended and painstaking study of these varieties as observed in their State, and subdivided them into types according to their size and other minor differences. Before giving the details of these types, I desire to state that though in cultures from throat exudates some solid forms of diphtheria bacilli may be found, these, by themselves, do not authorize the diagnosis of diphtheria, however characteristic their arrangement may be.

The granular forms are of seven types, and the presence of bacilli of any of these types is by itself characteristic of diphtheria. The second group or barred forms present six types, and likewise the solid forms.

The granular forms show spherical or ovoid granules. In all the types, excepting type B, the granules are methachromatic, taking a reddish tint with fresh Löffler's blue. The granules are usually at one or both poles or may occur elsewhere.

The bacilli belonging to the second group show a distinctly barred appearance as of an actual severance of pieces of protoplasm. The darkly staining portions vary in the intensity of coloration, but do not show methachromatism.

The smaller types of this group, types D and E, are not characteristic, and look very much like the *Bacillus xerosis*.

The solid forms include solidly staining forms of all shapes and also some having the appearance of diplobacilli.

This diplobacillary form includes those which many call pseudodiphtheria bacilli. The bacilli of this group, when found alone, will not suffice to make a diagnosis of diphtheria.

During the past year of laboratory work I have carefully noted the different types found in swab and culture examinations with the object of ascertaining whether here in Florida the same types are found as in Minnesota.

(The outfits furnished by the laboratory for the collection of samples of suspected diphtheria, do not contain any blood-serum tubes, but only a sterilized swab. This swab is planted on blood-serum as soon as it arrives at the laboratory, and examined after eighteen or twenty hours' incubation. A smear preparation is made from each swab after it is planted on blood-serum. The blood-serum is prepared according to the formula

of Löffler, and care is taken that it is always fresh.)

In 186 samples where diphtheria bacilli were found, 141 showed granular types and 45 barred types.

Type A was present in 39 cases.

Type B in three cases.

Type B' in two cases.

Type C in 56 cases.

Type C' in 40 cases.

Type D in 29 cases.

Type D' in three cases.

Type E in 13 cases.

Type F in one case.

It is thus seen that type C is the most common one, then in decreasing order, C', A, D, E, B, B', F.

Type A was most commonly found in smears made directly from the swab. Variation of type was often observed, that is to say, in specimens made directly from the swab certain types were present while in the cultures, different ones were observed.

Not only the virulence of the bacilli but also the quality of the medium and the number of days that elapse before the swab is examined and planted may have some influence on the types present.

I shall endeavor to keep a record of the different types during this year and ascertain, if possible, the virulence of the most common ones.

INTERMITTENT CLAUDICATION AND ANALOGOUS PHENOMENA (ANGINA PECTORIS, ETC.).¹

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In presenting this paper to you I am actuated by two motives—one the report of a rather infrequent symptom group that occasionally attends a disease of great frequency, general arteriosclerosis, but more often exists independent of it, the other—to dilate in some detail upon the more recent inquiries into the causation of stenocardiac attacks of which angina pectoris is the best known type. I desire first to present my notes of a case of intermittent claudication, and I trust this unusual condition will prove to be not without some interest.

Personal History.—The patient is a retired merchant. Until the age of sixty he was active in business and in fair health. Ever since a young lad he has complained of a weak stomach, but with this exception he had no illness that may have a bearing upon his present condition. Syphilis and excessive alcoholic indulgence are denied, though I have learned from other sources that he was formerly by no means moderate in the use of spirits. The gastric disturbance has

been a source of constant complaint, and is limited to a feeling of distress after eating.

He has been an invalid for several years past, has traveled extensively in search of health, has been to various spas; but his condition remains, with slight exception, stationary, and at present differs but little from that obtaining for several years. The whole picture as presented now has come in so gradual a sequence that it will be quite sufficient to detail existing symptoms.

Status Presens.—The patient easily shows his age of seventy-three years. He is sallow, his skin has a pasty, yellowish hue, and while he seems at times rather listless, his eyes brighten in conversation and his mind becomes alert and active; his temperament—so far as opportunity has been afforded me to judge of it—is a rather happy one; he constantly recalls interesting happenings of his early years, is pleased with happy reminiscences, and enjoys the telling of jokes and humorous events of his life. At the same time he is rather outspoken and severe with those attending him, though this—I am told—was his habit when in business also. His mind has always been clear, and his memory most excellent, nor has this undergone any marked deterioration. Subjectively he complains of gastric discomfort and a rather harassing cough, with some expectoration. In addition he finds walking difficult; his limbs feel heavy, and a dragging of the legs is apparent; there is at times a considerable degree of weakness in the lower extremities, and it frequently happens that, when rising from a sitting posture, he is compelled to take hold of some object or person to prevent his falling. This latter symptom, however, is due—not so much to weakness of the limbs as to a dizziness that comes over him, and frequently his body will sway perceptibly before he finds a safe and firm foothold upon the floor. Then he can usually proceed, though never without the support of a cane. It happens, too, and this is the symptom to which I desire to call attention, that, while walking with comparative ease for a few minutes—he suddenly experiences a sense of weight and a cramp-like pain in his legs; then they give way underneath him and he falls to the pavement, helpless. After a few moments' rest he can rise and proceed. He rarely has more than one such paroxysm, because—knowing his infirmity—he never ventures far from home.

Objectively we find of interest the following conditions: a waxy, sallow complexion and poor muscular development; hearing is dulled; sight is good with the aid of spectacles, bilateral arcus senilis is prominent. Signs of chronic bronchitis with emphysema are present, the latter not very pronounced. The cranial nerves are intact with the exception of the right hypoglossal; the tongue occasionally deviates perceptibly to the left, and is at times complained of as being heavy and unwieldy; this, associated with a weakness of the arms and legs predominating on the left side, indicates the existence of a cerebral lesion, though

¹ Read at the Fifty-eighth Annual Meeting of the State Medical Society of Wisconsin, Milwaukee, June 23, 1904.

in the absence of a seizure of any kind, neither patient nor attendants were aware that a hemiparesis existed. Tactile, thermal and localization sense are normal. The knee reflexes are reduced on both sides, ankle elonus is absent, skin reflex normal, pupillary reflexes sluggish. Co-ordination is fairly well preserved, Romberg symptom absent. The viscera show the following changes: The heart is somewhat enlarged generally, the mitral systolic sound is indistinct, occasionally lengthening out into a sort of murmur, but the diastolic basal sounds are not appreciably accentuated. The lungs give evidence of a chronic bronchitis with emphysema. The liver is of normal size, spleen likewise. The urine is said to have contained hyaline casts and albumen, but is now free from either of these constituents. The daily quantity passed averages 60 ounces or more and has a low specific gravity.

The radial arteries are hardly more resistant than normal. Pulsation is present in the dorsalis pedis artery, but *absent in both posterior tibials at the internal malleolus.*

The whole clinical picture, with widespread lesions, consisting principally of cerebral symptoms—general and local—and involvement of the heart, kidneys, and to a slight degree the superficial vessels, allows of but one interpretation—a general arterio-sclerosis, or arteriocapillary fibrosis. The one symptom, however, to which our attention is called, is the cramp and loss of power in the lower limbs, coming on without premonition and of brief duration: this is known technically as "Intermittent Claudication" (limping).

History of Disease.—Intermittent claudication had been recognized as an affection of horses many years previous to its recognition in man. A French veterinarian, Bouley the elder, gave the name in 1831 to a peculiar disease occurring in horses, found to be due to an obliterating endarteritis of the crural vessels. An animal, so affected, trots upon demand, but in about fifteen to twenty minutes it limps, stops, and is unable to move, its legs are spread apart, and, though urged on, it falls to the ground, rigid and helpless, and in apparent agony. Upon rising it continues to trot for a brief distance, when a similar paroxysm again throws it to the ground.

To Charcot¹ belongs the credit of first placing this symptom-group as it occurs in man upon a recognized clinical basis. In a clinical lecture on "Intermittent Claudication and Diabetes"² delivered at the Salpêtrière in 1887 (Leçons du Mardi à la Salpêtrière) Charcot reminisces as follows: "One day—a long time ago—in 1855 or 1856, I was then an interne in the service of Rayer—one of the patients told me that he could not walk longer than a quarter of an hour without being taken with a cramp in his lower extremities; he would rest, then begin to walk, and the cramps would recur. This man died, and I had an opportunity to make an autopsy and ac-

count for this bizarre symptomatology of which I had never before heard mention—which shows that one does not appreciate thoroughly all that one sees, for certainly these cases are not very rare; I know to-day of a number of them. The fact is that at the autopsy I found—curiously enough—a bullet encysted in the neighborhood of the iliac artery, which bullet our patient had received at the siege of Alger, in which he had taken part. You see that was a long time ago, for he died at the age of fifty-six. He received the bullet in the back, and it was impossible to follow its course. I found it in the abdominal cavity; it had struck the iliac artery, causing a traumatic aneurism which had obliterated the artery in its lower part. Collateral circulation had been established, and the arterioles, which normally were very small, had become voluminous, and were of such a character that the blood flowed freely when the patient was in repose; but when—and here is the mechanism of intermittent claudication—the limbs were fatigued by walking, the quantity of blood distributed to them was insufficient, a relative ischemia setting in at the moment, this absence of blood causing numbness, cramps, and inability to continue walking."

It needs the clever observation of one whose watchful eye allows nothing to escape and whose analytical mind interprets logically, to call attention to a condition which, though uncommon, falls nevertheless within the experience of many a physician.

Literature.—Charcot found fault with physicians because of their apparent neglect of this affection. He remarks (in 1887): "Curiously enough, though my essay of 1856, presented to the Biological Society was written not in Chinese but in French—in good French at that—I have not encountered a single physician who has taken notice of my observation." This was an unjust criticism, inasmuch as Leyden had in 1874 taken cognizance of Charcot's observation, and Erb in 1876. Sir Benjamin Brodie, in 1858, described the symptoms of intermittent claudication and referred to them as premonitory signs of senile gangrene. Aside from observations of Charcot's made at various times since his early report, there are a number of other references to this disease. A most exhaustive treatise on the subject has been written by Erb,³ who reviews the history of cases reported, and cites *in extenso* the literature extant; his own personal observations in this report cover thirteen cases of which the salient points are detailed. But recently Erb⁴ has published a record of 45 additional observations of this disease made since his first series of six years ago. Goldflam⁵ reported six cases in 1895 and more recently⁶ presented a study of 24 additional cases.

A number of others are reported from various foreign sources, making a grand total of 127, of which 120 are males.

American literature is apparently very meager,

for I have been able to collect but three cases, one each described by Riesman⁶ and Gordon,⁷ of Philadelphia, and Levy,⁸ of Syracuse. Gordon's was not a case of pure intermittent claudication.

Symptomatology.—The development of the symptoms usually present may be briefly described as follows: paresthesias in the feet; then vasomotor disturbances, such as blueness, redness, pallor, or coldness of the feet; next the motor symptoms as described: walking becomes difficult, it is found impossible to proceed because of a rigidity or painful cramp in the legs; after a period of rest locomotion may be resumed, only to find the paroxysm returning after a brief time.

Although intermittent claudication is a characteristic and frequent symptom of arteritis—this being the pathological condition, as we will find—it may be absent entirely, and the arterial disease be manifested by pain arising spontaneously in a condition of rest, and independent of walking. This pain may be in the calf, along the sciatic nerve, in the sole or toes, or there may be but little pain and merely a sensation of weariness and formication. In such cases *the absence of the arterial pulse in the foot is the diagnostic feature*. The symptoms mentioned have frequently led to erroneous diagnoses of sciatica, neuralgia, and rheumatism. When the arteritis—which is a progressive disease and involves progressively larger areas—has advanced to a marked degree, there will be present—in addition to the typical symptoms—attacks of pain, even when the limbs are at rest. Occasionally the disease seems to arrive at a certain degree of severity and then remain stationary.

My patient has practically no pain while resting in bed, and enforced rest brought on by a severe attack of sciatica has put the other symptoms in abeyance. His condition is not progressing.

Objectively, some signs of disturbed circulation are usually present: superficial dilated veins, cyanosis, edema, cutaneous petechiae, phleboliths, and phlebothromboses. The muscles are at times sensitive to pressure, atrophy may take place, and active fibrillary contractions are seen. But more important than these vasomotor and other disturbances is the circumstance that *pulsation of the dorsales pedis and tibiales posticae is frequently either entirely absent, or can be appreciated with difficulty*, and the rigidity of these vessels can frequently be determined. Of the 24 cases reported by Goldflam, pulsation in both dorsales pedis arteries was absent in 13, on one side only in 10, while both were weak in but one case. Both tibiales posticae were pulseless in seven, one artery only in eight, and in the remaining nine pulsation was present.

Of Erb's recently reported 45 cases, 30 were bilateral, 15 unilateral. Of the 30 bilateral cases, pulsation in all four pedal arteries was absent in 16 cases, three were absent in two cases, two in seven cases, and in only one case was the ab-

sence of pulsation in a single artery noted. In four typical cases all four arteries pulsated perceptibly. In 13 of the 15 unilateral cases, pulsation was absent in both anterior and posterior tibial arteries. In my case both dorsales pedis arteries pulsate, but the tibiales posticae do not. These cases demonstrate the frequent association of this symptom with the disease under consideration, and serve to emphasize its diagnostic importance, more particularly when the unmistakable classical symptoms are not present. In 37 of Erb's second series of 45 cases other unmistakable signs of arteriosclerosis were in evidence.

While in most cases recorded the symptoms are bilateral, the disease has been encountered affecting but one limb. In these cases the dorsalis pedis and posterior tibial arteries pulsated in but one limb, but where the symptoms occurred symmetrically pulsation was either absent or slight. Because of the fact that the limping is not a constant feature of all cases, Erb suggests a name based upon the clinical and pathological features, "Dysbasia Intermittens Angiosclerotica."

Analogous Phenomena.—Weber⁹ describes the case of a man whose left common iliac artery was obliterated by accident, and who suffered from muscular cramps in the left leg, but unaccompanied by other features of intermittent claudication.

Nothnagel has described analogous phenomena of the upper extremity.

Charcot called attention to the similarity of the symptoms to those of angina pectoris in the sclerotic occlusion of the coronary arteries; in fact, one of the cases of intermittent claudication coming under Charcot's observation, died of angina.

There are cases of milder symptomatology, as we know, due to sclerosis of the coronaries or the first portion of the ascending aorta, in which the symptoms are about as follows: the patient, while walking—is suddenly taken with a pain beneath the sternum, radiating to the epigastrium and into the back, associated with great anxiety. After a rest of a few minutes he can proceed, though there is danger of a repetition upon exertion. A hearty meal may also bring on an attack. These are cases of "angina d'effort" (angina following effort)—with a true claudication of the heart.

J. Schnitzler¹² reports a symptom-complex which he terms "Intermittent Ischemic Dysperistalsis"—an intermittent painful peristalsis on an ischemic basis. The symptoms in his case were those of excruciatingly severe intestinal cramp-like pain, with distention, and without any symptom of obstruction. The symptoms were found to be due to thrombosis of the superior mesenteric artery, the result of arteriosclerosis. He draws a parallel between this condition and that of intermittent claudication. Others have since then made similar observations.

Breuer¹³ reports two such cases. It is probable that the severe attacks of colic that have been

recorded by various observers as symptoms of thrombosis of the intestinal arteries, are in reality to be ascribed to this "ischemic dysperistalsis"—to use Schnitzler's term. Breuer calls attention to the fact that in the reported cases of aneurism of the mesenteric vessels, and more particularly in the cases of aneurism of the aorta in the neighborhood of the superior mesenteric artery, there were noted long and severe colic-like intestinal pains. Collateral circulation will—in all such cases—make these attacks infrequent for a time, but as soon as occlusion of the vessel is entirely or almost established, the symptoms ensue with severity and persistency. We might bear in mind that the pains of syphilitic arteritis are of vascular origin.

There are doubtless other cases of arteriosclerotic pain that fall in the same category. Breuer cites the case of a patient who suffered severely from renal colic, supposed to be due either to a tumor or hemorrhagic infarct. Post-mortem examination revealed neither tumor nor signs of an infarct, but a marked sclerosis of the renal arteries. Kaufmann and Pauli¹⁴ made a careful study of stenocardiac pains in the epigastrium, and conclude that these cramp-like spasms are not primarily due to a relative ischemia of the part, but that an angiospasm of the partly sclerosed vessel determined the ischemia and pain.

Ortner¹⁵ cites a case of angiosclerosis of the abdominal vessels (abdominal aorta, coeliac axis and mesenteric arteries) with symptoms of angiospasm—an intermittent claudication of the intestines.

Wagenmann (cited by Ortner) reports having observed with the ophthalmoscope an interesting phenomenon in a patient who had marked general arteriosclerosis. The patient complained of a periodic clouding of vision, and during such an attack Wagenmann distinctly observed a spasm of the retinal vessels. This may with justice be termed an intermittent claudication of the retina.

Having in mind that claudication seems, thus, to involve various organs, Ortner suggests that Erb's term "dysbasia" (difficult walking) I. A. be modified to "dyspragia" (difficult functioning) intermittent angiosclerotica; we may thus speak of a dyspragia of the extremities, heart, brain, retina, kidneys and bowel.

Causation of Symptoms.—Charcot's explanation—and this applies to the analogous phenomena just stated as well—that when the limbs are at rest collateral circulation is well established, but when they are put to the exertion of walking, a temporary ischemia of the part followed by transient muscular spasm and paraplegia, sets in as a result of the sclerotic occlusion of the artery, is generally accepted.

This theory, however, that the arterial disease is the direct and sole cause of the pain and paresis in intermittent claudication as well as in angina pectoris—the symptoms being due to an ischemia of the muscles—a cry for food—is in-

adequate to satisfactorily explain these phenomena. This is possibly best understood if we call to mind the well known fact that the cases of angina pectoris are numerous in which there is but slight sclerosis of the coronary vessels, and vice versa—that stenosis of the coronary artery has been found in the case of persons never known to have suffered from angina pectoris.

In a number of autopsies made upon patients suffering from stenocardiac epigastric pains, Houchard (quoted by Kaufmann and Pauli¹⁴) found a condition of sclerosis but no anatomical narrowing of the blood vessels, and therefore, he too argued that an ischemia on this basis could hardly be a prerequisite of these attacks.

Weber⁹ too—because of reasons mentioned—namely—that there is no constant interdependence of coronary sclerosis and angina pectoris—is disinclined to place credence in Charcot's explanation. He maintains "that muscular cramp does not take any part in angina pectoris or in the phenomena preceding senile gangrene in an extremity, but that cramp is likely to occur in any muscle where an accumulation of waste products takes place, whether this accumulation be caused in healthy animals by rapid catabolism due to excessive exercise (cramps following overexertion, as in athletes), or by insufficient removal of waste products in cases of disease due to stenosis of the main arteries and consequent diminution of the blood stream through the affected part."

We are indebted to Nothnagel for a solution that has an air of great plausibility, seems to be well substantiated by facts, and has of late received generous recognition. Nothnagel claims that the symptoms of painful spasm are of arterial origin, that the developing ischemia is due to an arterial spasm, the result of an effort on the part of a diseased artery to supply an increased quantity of blood, and that the pain is in reality a blood-vessel pain. Such an angio-spasm would—though the organic occlusion of the vessel be but partial—cause an absolute ischemia of the part nourished, and, as a consequence of this, severe symptoms follow. It is probable, too, that this angiospasm may be transmitted from its seat of origin to other vessels in continuity with it, and thus cause very extensive spasm, pain and ischemia. This is seen in cases of very sudden death in attacks of angina pectoris when but a small embolus or thrombus is lodged in a coronary artery, and is evidenced too by the radiation of the stenocardiac pain from the precordium into the vessels of the arm.

These considerations shed light upon the probable causation of this painful spasm—intermittent claudication, that is—arteritis plus arterial spasm, but of even greater interest is the light shed upon the possible causation of the symptoms of that very frequent affection, angina pectoris; certain it is that the cases of sudden death in which but a slight coronary sclerosis is found are numerous, and these, I believe, are best ex-

plained upon Nothnagel's theory of angiospasm which produces a relative occlusion of the vessels, and which, because of its transmissibility by continuity, may account for the radiation of the pain into the arm.

Complications: Gangrene and Diabetes.—The essential morbid changes that produce the symptom-complex intermittent claudication, being—as has been stated—a more or less complete obliterating endarteritis involving the distal arteries of the foot and leg, and frequently the femorals and iliacs as well, it occasions no surprise to learn that gangrene of the affected extremity occasionally supervenes. This has been frequently encountered, and appreciation of this danger is nowhere better expressed than in Charcot's words: "Each time that I saw these symptoms (intermittent claudication) appear, it has seemed to me that I could see beginning the second act of a drama of which one could, as time passed on, detect the evolution." Of Goldflam's 24 cases, seven terminated in gangrene. In these cases the paroxysms were unusually painful. I. H. Levy also cites a case with the same outcome. Charcot and others have called attention to the occasional association of symptoms of intermittent claudication with diabetes. When one recalls the frequency of gangrene—the result of the arterial obliteration—in the latter affection, the possibility of the development of this peculiar symptom-group is self-evident.

Etiology.—Etiology, the ready inference is justified that whatever causes act in producing arteriosclerosis elsewhere obtain here, too, and so we may include as factors in the causation of this affection: alcoholism, gout, lead, syphilis, tobacco, and exposure, the last three being the prominent factors in Erb's cases, special stress being laid upon tobacco abuse as a cause.

Erb asks the pertinent question (but leaves it unanswered): why—if arteriosclerosis is so very common—is intermittent claudication so relatively rare, and what is it that determines the development in these cases—as points or predilection—of this sclerosis in the limbs? In one of Erb's cases there was no distinct evidence of sclerosis of the radials, temporals, carotids or heart. This applies in a measure to the case I report, though it is quite evident from the history and symptoms that the vessels of the internal viscera are affected.

Diagnosis.—There are two diseases with which intermittent claudication may at times be confounded, these being erythromelalgia and Raynaud's disease. Pathologically they are very similar, for all are due in part at any rate to vascular changes, and a thickened intima is constantly found. The difficulty of distinguishing these three diseases is heightened by the fact that their symptoms are often very similar, and because combinations of the affections apparently exist (Cassirer¹⁰). The case reported by I. H. Levy had vasomotor symptoms suggesting an erythromelalgia.

Mitchell and Spiller,¹¹ in their report upon the microscopical examination of the tissues of an amputated toe from a case of erythromelalgia, report finding, in addition to degeneration of the nerves, marked proliferation of the intima and media of the vessels, and in some sections almost an occlusion of their lumen.

The most prominent symptoms that differentiate intermittent claudication in its pure form from other affections, are the intermittent character of the paroxysms—absent when the patient is at rest, and produced only by walking—and the absence of pulsation in one or more of the distal arteries.

The diagnostic importance of the latter symptom is well demonstrated by Erb. Examinations made upon 700 individuals who were presumably not suffering from grave heart or vascular disease, or such conditions as edema, eczema or elephantiasis that would make palpation difficult, indicate that the pulsation of the dorsalis pedis and posterior tibial arteries can normally be felt in 99 per cent. of all cases. It does not follow, however, that the absence of pulsation results in the symptoms mentioned, because appreciation of the pulsation may be impossible, and this be due only to a rigid and not entirely occluded vessel; again, even though it be occluded, an established collateral circulation may prevent further symptoms. Furthermore, one of Erb's cases teaches him that the symptom-group—intermittent claudication—may be present without the absence of pulsation in any one of the four vessels.

Treatment.—Intermittent claudication is not a disease *sui generis*, but merely a peculiar clinical manifestation of arteriosclerosis involving the vessels of the lower extremities. Appreciating its pathology, an early recognition of the import of the symptoms is made manifest, in order to anticipate and prevent, if possible, complete arterial obliteration, and foretell a probable gangrene consequent upon such occlusion. That the disease has been insufficiently recognized before such a complication set in is undisputed.

The measure of comparative safety lies in the establishment of a satisfactory collateral circulation, or even re-establishing a channel in the occluded vessels—in order to improve the nourishment of the limb. Therefore bodily rest with warmth and moisture is an all-important element. If a suspected or probable cause is known, this must be corrected at once. The diet must be attended to and the personal hygiene regulated.

The use of alcohol and tobacco must be interdicted, and all excesses and abuses avoided. Hydropathy, massage and electricity seem to have been of service in some cases. Among drugs the iodides, vasodilators and heart tonics are indicated. Goldflam found the iodides of questionable value. Theobromine in the shape of diuretin has of late been advocated as relaxing vasomotor spasm, and would theoretically be indicated. In the main, however, one must rely on

a therapeusis of general character, not medicinal. When walking is to be resumed it is to be done with the utmost caution to avoid undue fatigue.

Both Erb and Goldflam report cases that were relieved of all symptoms, some in which pulsation returned in the crural vessels, and other cases that were markedly ameliorated. In the case reported above faint pulsation can now be felt in the right posterior tibial.

CONCLUSIONS.

The study of the cases of intermittent claudication thus far recorded justify the formulation of the following conclusions:

1. Intermittent claudication is far more frequent symptom-complex than generally recognized.

2. It is doubtless frequently and freely confounded with sciatica, neuralgia and rheumatism.

3. Careful and detailed inquiry into the symptoms which usually come on while walking and are absent when at rest, together with their intermittency should lead to a suspicion of the diagnosis; this will be made absolute by finding that

4. Pulsation is absent in one or more distal arteries (dorsalis pedis and tibialis posticus) of one or both legs.

5. The pain is of vascular origin and due to an arteritis plus—in many cases—angiospasm of the affected vessel.

6. The various internal viscera may suffer from such an angiospasm when their vessels are sclerosed, the most prominent prototype being the heart in the common condition, angina pectoris.

7. Total occlusion of the vessels, as occasionally found in intermittent claudication, may lead to gangrene of an extremity.

8. Early recognition is essential, in order, by appropriate treatment, to prevent this dire and frequent complication.

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New York Polyclinic.—Emeritus Professor H. Newton Heineman will deliver a lecture at the New York Polyclinic Medical School and Hospital on Monday, December 5, 2.30 P.M., through the courtesy of Professor Manges. The subject of this lecture is to be "The Nauheim Treatment of Heart Disease."

MISOCAINIA IN MEDICINE.

BY ACHILLES ROSE, M.D.,
OF NEW YORK.

LOMBROSO has called the deep rooted inclination of mankind to combat new ideas "misoneismus." For this barbarous term let us substitute a correct name: "misocainia."

In medicine, as in other sciences, many new things are brought up from time to time which, later on, are recognized as new errors; this explains why new ideas are received with caution, even with suspicion; but this is nothing morbid and cannot rightly be called misocainia. We can speak of misocainia only when the motives of the opposition against new ideas are prejudice, selfishness, and indolence—the archenemies of all progress—and we may classify misocainia as phrenitis *sui generis* in cases in which it develops to such a degree that men of science, of exalted position, lose the sense of truth and honor and degrade themselves by the employment of unworthy means in order to suppress a new idea or intrigue against and injure those who have promulgated a new truth.

Of this form of phrenitis examples exist in the history of medicine.

John Kanold, in the year 1708, wrote: "It is to be hoped that at this time no one who has common sense will deny that the *historia morborum* is the most important and most valued support of the whole of medicine, because, by thorough knowledge of this history, we learn to arrive at the true pathologico-etiological conception and consequently we find the necessary and reliable *indicationes curativæ*."

Nothing in the world has caused more animosity, more persecution, than the promulgation of new religious doctrines, but the cruelties originating in religious fanaticism are more easily explained than the rage of men of science against new ideas.

While the ecclesiastical courts of several countries had hundreds of thousands tortured, burnt at the stake; while for centuries, even in America, unfortunate women, supposed to be witches, were drowned, there is no case known in which a physician, for the promulgation of a new scientific truth, has been tortured or burnt at the stake.

The fact is that a physician, Servatus, the discoverer of the pulmonic circulation, a forerunner of Harvey, was burnt at the stake on October 27, 1553, at the instigation of Calvin. His agony was prolonged in a most cruel manner by keeping the fire low. After he had been for half an hour on the burning stake the unfortunate man asked to have more wood applied to the fire, that death at last might relieve him. But Servatus did not die a martyr to science; he was the victim of religious persecution, because he had expressed an opinion about the holy Trinity which differed from Calvin's teaching.

The case of Galileo may be mentioned here, as it offers an opportunity to expose one of the most pertinacious historical lies. The story that Ga-

lileo had been tortured is found in school books, and it is difficult to eradicate it.

Galileo had studied medicine; he was a physician, although he devoted himself to study of mathematics, astronomy, and the natural sciences. He made many enemies by mixing quite unnecessarily theological controversies with his astronomical discoveries. It is true that he was brought before the tribunal of the Inquisition, but the legend of his torture is an invention. Whatever accusations against the clergy for their intolerance may be justified, towards Galileo they acted rather generously.

In fact, there is no case known of a physician being tortured or burnt at the stake on account of a scientific discovery.

Johann Baptista van Helmont, born in Brussels, in the year 1578, one of the greatest scholars among the physicians of his time, the discoverer of carbonic acid, wrote against a certain sympathetic remedy. For this he was taken before the Archbishop of Mecheln and punished with two years' imprisonment, because he had denied the healing power of religion. His colleagues called him all sorts of names because he was opposed to blood-letting, the universal remedy for almost all diseases at those times. Gui Patin wrote the following necrology: "Van Helmont étoit un méchant pendent flamand, qui est mort enragé depuis quelques mois. Il n'a jamais rien fait qui vaille. J'ai vu tout ce qu'il a fait. Cet homme ne méditoit qu'une médecine toute de secrets chimiques et empiriques, et pour la renverser plus vite, il l'inscrivait fort contre la saignée, faute de laquelle pourtant il est mort frénétique."

During the period of the scholastics natural science was subordinated to, was the slave of, theology. The new fetters which Protestant orthodoxy wound around natural science were as tight as the old ones. Dogmata of the church exerted a great power.

In the year 1640 Juan del Vego introduced Calisaya bark into Europe. The new remedy became at once the object of much dispute. Because the Jesuits recommended and praised it, it was called *pulvis Jesuitarum*, and this name was enough to make it disliked among the Protestants. Physicians were against it because it cured intermittent fever too quickly, depriving them of a certain amount of income.

Physicians were too humane to manifest their intolerance by fire, as did the church; they went to work in a more subtle way, but they were cruel all the same, and after all they imitated to some extent the example set by the church. The object of the inquisition was to exterminate heresy, but as the fine humoristic expression was "without bloodshed," the heretics were burnt.

There were neither bodily torture nor stake for men of science who promulgated a new truth that was apt to harm the prestige of the authorities of the day; these men of science were tormented until they became ripe for the phrenocomion. The misocainists of the medical profession were

like the clergy, "no blood shed;" they only differed in so far as they applied no bodily torture and did not burn their victims at the stake; they simply drove them to insanity.

The history of Harvey's discovery is too well known to need recapitulation here.

Harvey's book on the circulation of the blood is the earliest and most brilliant fruit of the method, founded by Bacon, of exact research in natural sciences. In regard to time it is one of the first products and in regard to value the greatest product of English medical literature, written throughout in a genuine scientific spirit.

Quite recently there appeared an editorial in one of our medical journals, according to which Harvey was not at all the discoverer of the circulation of the blood, and his book, this immortal work of Harvey, was called "verbose and somewhat muddled."

Es liebt die Welt das Strahlende zu schwärzen,
Und das Erhabene in den Staub zu ziehn.

Harvey had many opponents, but he did not, with one exception, answer their attacks; being thoroughly convinced of the truth of his teachings, he left it to time that he should be understood, and yet in the evening of his life he had the satisfaction of seeing his teachings adopted.

What the masses thought of Harvey's exertions we learn from the fact that after the publication of his work on the circulation his practice fell off; he was considered of diseased mind. The excitement Harvey's discovery caused in medical circles, and among the educated in general, was most extraordinary; especially were physicians disgusted with a new thing which they considered of no value for the practice.

Würtz, who was far ahead of his time, must also have met with misocainia. He writes: "All sensible surgeons will excuse this, my writing, and easily admit that among the ancients there must have existed much ignorance and great stupidity as well as in this, our own time."

Leopold Auenbrugger discovered, in the year 1754, that the different kinds of sounds heard on percussion of the thorax, furnished an aid to judge the condition of the organs of respiration. His immortal work "*Inventum novum ex percussione thoraci humani ut signo abstrusos interni pectoris morbos detegenti*" appeared in the year 1761, simultaneously with the work of Morgagni, by which a new era of pathological anatomy was inaugurated.

Percussion shared in full measure the fate of most of the great discoveries. Of the few who took notice some treated it with indifference, some, and among them especially the Vienna physicians, with decided animosity, with disdain and ridicule, or with senseless contradictions. Haller was the first who openly expressed himself in its favor. In his review of Auenbrugger's book he said: "All such propositions, although they need not at once be accepted, merit to be listened to with respect." To Ludwig, of Leipzig, is due the credit of having been the first to recognize,

in 1763, the importance of Auenbrugger's discovery to its fullest extent; he spoke of percussion as the light which should banish the darkness that covered the diseases of the thoracic cavity.

It was reserved for mioscainia in the nineteenth century to drive two of the great investigators in medicine into the lunatic asylum.

Julius Robert von Mayer is the originator of the doctrine of the conservation of energy. In different publications he demonstrated the law of the indestructibility of force. For the first of these he had to pay the expenses of printing, as no publisher would assume the risk. He was the first to grasp the conception of the equivalence of exertion and heat; he enunciated this principle with clear distinction; applied it, with great acumen to astronomy and to human physiology, furnishing conclusive evidence for his teachings. His labors did not meet with the approval they so richly merited, and the contradictions, the attacks he had to suffer, drove him to insanity. From 1852 to 1854 he was an inmate of the lunatic asylum of Göppingen, where he was treated, according to the old fashion, with locked chair and straight jacket. Dismissed as cured in 1854, he gradually had the satisfaction of seeing that his discovery was appreciated to its full value in all scientific circles.

✓ Ignaz Philipp Semmelweis was born in Ofen, July 1, 1818. At nineteen years of age he began the study of medicine and graduated in Vienna in 1844. At first he devoted himself to general medicine under the inspiring influence of Skoda. In 1846 he became assistant in the first obstetrical clinic of Professor Klein. In this clinic there had been for many years an enormous mortality from puerperal fever reaching in one year so high a total as 31.3 per cent.

These disastrous conditions worried Semmelweis day and night. At that time there existed an abundance of theories to account for them, the peculiarity of which we shall understand when we consider the state of medicine in general at that period. Among the supposed or named causes was the transposition of the milk or the rising of the milk to the head, or milk metastasis; some accused cosmic or telluric influences, without assigning any reasonable definition of their meaning. Some explanation, however, had to be constructed in the absence of any definite ideas.

In the year 1847, the pathologist Kolletschka died. At post-mortem examination he had received a punctural wound of the finger and had succumbed to the pyemia which followed this accident. The details of this case of pyemia after wound disease corresponded exactly with all that Semmelweis had observed at necropsias of women who had died of puerperal fever.

As happens with the true genius, he found as quick as lightning the explanation which had been sought in vain for a long time: puerperal fever is caused by wound infection, it is pyemia proceeding from the wounded inner surface of the uterus. Not the wound itself but its infection is

the external cause. Physicians and students, in the course of examination, by their unclean or insufficiently cleansed hands, transmit the noxa to the healthy but wounded woman. This seemed to him in accord with the observation that decomposing organic matter may cause decomposition and putrid infection in the living organism. He demanded that the hands should be disinfected with chlorate of lime water. This is in the main what he communicated as the result of his first researches. The greatest discovery in obstetrics, which has also become a far-reaching blessing to surgery, is connected with the name of Ignaz Philipp Semmelweis.

It is true that Semmelweis had forerunners; in the year 1831 Cruveilhier called women wounded while in the puerperium, and thought it possible that puerperal infection might proceed from their wounds. But how little impression this had made can be shown by the fact that the Academy of Medicine of Paris pronounced itself decidedly against Semmelweis in the year 1851, and again in 1858. Eisenmann and Henle, both pioneers of the parasitic theory of infection diseases and both too little appreciated, as also Denman, must, next to Cruveilhier, be named as real forerunners of Semmelweis. It is remarkable that in the many publications on Semmelweis which appeared in Germany, especially during the eighth decade of the nineteenth century, the American, Oliver Wendell Holmes, is not mentioned. Holmes had spoken on the etiology of puerperal fever in a manner similar to that of Semmelweis before a medical society, in April, 1843, and had suffered, before Semmelweis, the most violent attacks by the authorities of his day. His discovery and the injustice done to him have been described by S. Baruch. His history is so well known by us that I need not enter into details.

But even the forerunners had, as Semmelweis remarked, recognized only a part of the truth, not the whole truth. The revelation of this latter was reserved to Semmelweis. The nearest to him was undoubtedly our Oliver Wendell Holmes.

As a result of observing the precautions which Semmelweis thought necessary, the mortality in the first clinic became reduced to 3.08 per cent.

Very soon Semmelweis found that cadaveric poison (ptomain) was not the only noxa producing puerperal fever, but that, in general, ichor from living organisms or air impregnated with ichorous particles caused infection. To him the decomposed organic substances were the carriers of infection.

The misocainists accuse the discoverers of a new truth of having said things of which in reality they never thought. This feature was noticed when Niemeyer's book appeared in an English translation in 1870. Long after Semmelweis had said that cadaveric poison was not the only carrier of puerperal infection, his opponents, Scanzoni, Braun, Späth, Breisky and others, continued to accuse him of having spoken

of no other means of infection, and they gave him the nickname of the "cadaver apostle," and said that he was a very one-sided physician whose results were of the most meager significance. Semmelweis, in 1848, improved his method, which at first consisted solely in disinfection of the hands, in so far as that he insisted that not only the hands of the examiner but also the instruments and the dressing material, should be disinfected beforehand, and that patients with puerperal fever should be separated from those who had not been infected.

In this year, when strict and general disinfection was carried out, the mortality from puerperal fever in the first clinic sank still lower namely, down to 1.27 per cent., notwithstanding that examinations continued to be made by students.

Now, for the first time, Semmelweis came before the profession, speaking to the Vienna physicians, who were well aware of the former fearful condition, of his results.

One would have expected that when Semmelweis placed these plain figures before them and explained his views with great clearness and simplicity, all would have applauded him.

It is true some of the best men, Hebra, Haller, Skoda and Rokitsky, coincided with him without hesitation or reserve, but the representatives of his specialty, the obstetricians (with the praiseworthy exception of Michaelis, of Kiel) and especially his superior, Klein, opposed him, and took decided part against him.

In the oration of Ferdinand Hüppe, at the dedication of the Semmelweis monument before the Eighth International Congress for Hygiene and Demography, at Budapest, September 2, 1894, of which oration I have availed myself to some extent, he says: "Egoism, jealousy, fear of humiliation in view of the former miserable conditions, the dislike to abandon some nonsense to which they had become attached, the necessity of having to acknowledge their own gross mistakes, all these things manifested themselves by the actions of an omnipotent caste of bonzes toward the genius."

This was misocainia, that form of misocainia which borders on infamy. It is a distinct form of phrenitis.

At that time Semmelweis applied for a professorship: his enemies, however, frustrated his plans in this direction. The leading men in obstetrics in those days, Kiwisch, Scanzoni, Seyfert, Hammernick, had formed a conspiracy against Semmelweis.

But after all, a truth, new or old, cannot be suppressed without great exertions. In Vienna other men, Chiari, Helm, Arneth, stood up for Semmelweis, and in the year 1850 it seemed as if he had been victorious in Vienna. But this did not suit Klein and his partisans. They agitated to have him debarred by the States Ministry, and they succeeded. Semmelweis could find no place in Vienna. Deeply pained by such ingratitude he left and went to his native city, Budapest.

The want of animation, the obligation to care for the daily necessities, made him silent, and his silence caused his friends to halt in their zeal and their agitation for his cause.

His enemies, however, remained active, and the cities of Vienna and Prague secured for themselves the melancholy renown of having successfully combated the greatest and most beneficial discovery in obstetrics.

Thus the universities of Germany, and especially Vienna and Prague, were eager to suppress, by means of detestable star chamber practices, the most genial obstetrician in history.

At last, in the year 1855, the great investigator was honored by the Hungarian Government according to his merits. Without any step on his part to secure the position, he was made professor of obstetrics at the university of his native city. Here he enjoyed some years of happiness. A professorship at the university of Zürich was offered but was declined by him.

Scanzoni, Braun, and Späth continued to defame Semmelweis. Again and again they accused him of having spoken of the cadaver poison as the only carrier of puerperal infection. It is most remarkable how the misrepresentations and errors of Scanzoni are long-lived, most persistent in literature and tradition. As late as 1870, physicians of Berlin spoke of Semmelweis as the cadaver apostle, and even at this present day there are some, who have read only one part of the literature, who say Semmelweis had not been appreciated in lifetime because he had persisted in attributing puerperal infection solely to cadaveric poison. It is the same case with Scanzoni's error about the danger of carbonic acid gas inflation. It seems impossible to eradicate the errors of Scanzoni.

The moral deficiencies of his adversaries—misocainia sometimes suspends morals—were attacked by Semmelweis in a severe manner.

The open letters which he addressed, during the years 1861 and 1862, after the publication of his book on the etiology and prophylaxis of puerperal fever, to several prominent obstetricians and to all the professors of obstetrics who refused to grant him a hearing, and whom he called murderers, are well known. It cannot be denied that the tenor of these letters far outsteps the customary bounds of restraint, but no reproach on this account is due from his detractors to the man whom they had so greatly hurt. The tenor of his indignation corresponds with the baseness of the character of his opponents. Their celebrated open letters serve to show how bitterly he had been attacked and what tortures he must have endured.

"The deplorable conduct of his opponents" says Hüppe in his oration, "is the more inconceivable, as many among them had accomplished original work of lasting value in other branches of obstetrics, so that there existed no danger of the lessening of their fame." The explanation is that they were afflicted with intractable misocainia.

In the year 1861, Semmelweis had collected all his writings in his work on "The Etiology, Conception and Prophylaxis of Puerperal Fever." This work is one of the real classics of medical literature.

Completed in some details, with the addition of statistical evidences, but without any essential changes, he gives the views already presented in 1847 and 1848.

In accordance with his ideas in regard to etiology he demands in case of autoinfection all that we now call "antisepsis," in all other cases on the part of the operator cleanliness and disinfection of the hands, the instruments, the dressing material, the clothing, that is, all that we now call "asepsis."

This work had at first, thanks to the conspiracy of his enemies, almost no success. Scanzoni, Braun, Späth, Breisky and others, continued to call him the cadaver apostle. Only Lange, of Heidelberg, Kugelmann, of Hanover (the latter in writing to Semmelweis expressed "the holy joy" he had experienced when reading the book and calls Semmelweis a second Jenner), Hirschler and Markusovsky, of Pesth, stood up firmly for him, while on the occasion of the Thirty-sixth Congress on Natural Sciences, at Speyer, not only the obstetricians present, with the exception of Lange, but also Virchow were against him.

One of the most highly praised and most instructive books in medical literature is the work of the great surgeon Pirogoff, on the errors he committed in his surgical practice. Indeed we may learn as well from the errors of great men as from their correct ideas. Virchow's error teaches us not to trust too much to authority. However highly we esteem Virchow, we cannot omit speaking of his mistakes when writing medical history.

In the year 1864, the Bohemian parliament wished to hear the opinion of experts on puerperal fever, and lying-in institution buildings. Oppolzer, Rokitsansky, Skoda, Virchow, Lange, Schwarz, Heckner, and Löschner were the experts selected, Oppolzer, Rokitsansky, Skoda and Lange expressed themselves in accordance with the principles of Semmelweis. Virchow's opinion read as follows: "The main cause of the rise, development and spread of puerperal fever, is an individual *predisposition* to diffuse and malignant forms of inflammation; puerperal fever can set in in consequence of this predisposition solely, *without any contagion*. Local specific infection, contagion, happens only when the epidemic is at a certain high stage and when the contagion is of a certain intensity. In individuals without predisposition the contagion may remain ineffective."

As late as the year 1874 Virchow, but very conditionally, pronounced himself in favor of the parasitic theory.

Of the pathologist-surgeons of that time, that is from 1860 to 1867, only Roser promulgated views which came near those expressed by Sem-

melweis, but they were also attacked by the leader in pathology, Virchow, and by his adherents, Billroth and Weber.

That the results could not be everywhere and at once favorable we can understand now, when we consider that the technics had to be learned first, and that it was only later on that bacteriology brought full clearness in the understanding of most details.

This is an excuse to be made for those opponents of Semmelweis who had honestly tried his method. Where such honesty is wanting, as in the cases of Braun and of Scanzoni, where the requests were executed with no good will and imperfectly, the unsatisfactory results and the return of epidemics are not to be wondered at. Misocainia will not allow any good results, any success to a new idea, and no means are too base to suppress the new idea.

It was not granted to Semmelweis to see the triumph of his teachings. He became more and more irritable, and when he had addressed lay people in the street, to whom he said that they were not prejudiced like the professors, and to whom he explained his theory, he was taken to the lunatic asylum, and there he died on August 13, 1865, in his forty-seventh year.

Twenty-nine years after his death, physicians from all parts of the world united in erecting a monument in his honor, to commemorate the services rendered by him to science and to mankind.

Misocainia, so long as it is not manifested in a dishonorable manner, is natural, but misocainia expressed in malevolent misrepresentations is phrenitis.

I have undertaken to call attention to the rôle misocainia has played in the history of medicine. I had neither time to enter deeply into the subject, nor was I prepared for such serious historical studies. I hope, however, that this little collection of examples will be of interest and will aid in giving light on a remarkable form of phrenitis, and that the knowledge of the facts enumerated will be of some usefulness.

A NEW CASE OF CHLOROMA WITH LEUCEMIA, WITH A STUDY OF CASES REPORTED SINCE

1893.

BY GEORGE DOCK, M.D.,

AND

ALDRED SCOTT WARTHIN, M.D.,

OF ANN ARBOR, MICH.

(Continued from Page 1032.)

This conception of Kunderat seems difficult or even impossible to accept literally, on account of the numerous connecting links between it and the very diseases that Kunderat separated from it, and also because of the older and equally unsatisfactory use of the term lymphosarcoma.

Rosenblath emphasized the difficulty of classifying chloroma among lymphomata on account of the tendency of the latter to remain within the capsule of the gland and not form metastasis.

"In chloroma even the tumors of the orbit, which seem at first glance to act like lymphomata, are quite different. They have no capsule, and grow through fat, nerves, and muscles. The majority of the other larger tumors are closely united with the periosteum and grow diffusely." Clinically and microscopically he thought chloroma grows very differently from leucemic and pseudoleucemic lymphomata, but he recognized the intimate relationship between chloroma and leucemia, and admitted that the histologic structure differed from that of sarcoma.

Risel, who made the anatomic examination in one of Rosenblath's cases, agrees in general with the points I made in my first report against the sarcomatous nature of the process, and emphasizes the clinical and anatomic reasons for assigning it to the group of leucemia and pseudoleucemia, and with the histologic structure of lymphosarcoma or lymphoma. But he prefers the term chloroma as less likely to involve error. According to him one could suppose the disease began in the prevertebral lymph glands, or perhaps in the lymphatic tissue of the bone-marrow. He also admitted the possibility, in his own case, of an origin in old, caseated, retroperitoneal glands. He thought the blood condition was not sufficiently known to place the disease in a definite group of leucemic processes.

Dunlop, too, thinks that lymphosarcoma is perhaps the best term to apply to "the growths found in chloroma resembling on the one hand lymphomas in their structures, and sarcomas in the fact that they arise from the periosteum and that they spread by metastasis." This is of course somewhat different from the conception of lymphosarcoma held by some of the authors previously quoted, and not altogether in line with recent views on the pathology of sarcoma.

Gümbel described the tumors in his cases as lymphomatous, having many resemblances to bone-marrow. The cells were mononuclear large lymphocytes, like those in the blood and bone-marrow, lying in the scanty connective tissue, evidently that of the original tissue. The tumor was not circumscribed in any part, but spread out irregularly, accordingly to the denseness of adjacent tissue. The tumors were poorly vascularized, without evidences of newly-formed vessels. Admitting the resemblance of the tumor to sarcoma, he points out that chloroma is essentially limited by mechanical conditions as regards its spread, unlike the unlimited growths of sarcoma. Another point is the impossibility of finding a primary growth. Other points of difference are: The absence of giant cells, of bone formations, of characteristic circumscribed metastases in internal organs. The cells of the tumor he, too, thinks are the same kind as the majority of those in the blood, the bone-marrow, and the splenic pulp. "All the lymphoid tissue in the body was increased. In the bone-marrow the normal elements were lessened or absent, but the large lymphocytes much increased." This led

him to place the primary seat in the bone-marrow. Moreover, the tumors first demonstrable clinically and apparently the oldest anatomically, are with rare exceptions near the skeletal system—i.e., in tissue nearly related to bone-marrow. He considered the tumors as secondary formations, beginning probably in lymphadenoid tissue and growing out from there. "Inasmuch as chloroma remains separated from the lymph glands by their capsules, it is evident that the change in the glands is the expression of the general disease, that the tumor does not originate in them. The term lymphosarcoma is therefore not applicable." He notes the close resemblance that chloroma cases have to acute leucemia in their respective terminal stages.

Trevithick rejected the idea of sarcoma on account of the symmetry of the lesions, the relative position of the organs invaded, the irregularly disorderly disposition of the individual invading cells, and the marked absence of vascularization. He described the cells in the various tissues and found them identical. The bodies are irregularly polygonal, the nuclei large. In the lymphatic glands he found many vascular, presumably lymphatic, spaces, wherein the endothelium is evidently undergoing immense hyperplasia. These he thought had an important part in the morbid condition.

Hichens, on the other hand, who has a somewhat imperfect idea of my own reasons for objecting to the term sarcoma, thinks that the erosion of bone which occurs in some cases is suggestive of sarcoma—which of course might be said quite as truly of aneurism of the aorta—and suggests that lymphatic leucemia is a fluid sarcoma of the hematopoietic system and that chloroma is only another manifestation of the same disease characterized by solid deposits.

Sternberg considered the process a lymphosarcomatosis in the sense of Kundrat and Paltauf. His patient probably died early in the disease, before the process had spread beyond the lymph glands. He thinks there are certain relations between pseudoleucemia, leucemia, and lymphosarcoma, though the anatomic separation is possible. To him the difference depends on the presence or absence of heterotopy. The growths in the dura and periosteum he considered evidence of lymphosarcoma rather than lymphoma.

Klein and Steinhaus were the first to report a marked departure in the histology of chloroma. In films spread from the spleen, bone-marrow, and the green tumors, they found that most of the cells instead of being lymphocytes were neutrophile cells, mostly myelocytes. The rest were lymphocytes, or in the bone-marrow, these with eosinophiles and red corpuscles. Sections showed the same kind of cells. Accordingly, these authors would remove chloroma from the lymphosarcoma group and place it among the leucemias. The green color they would give a subordinate place among the characteristics of chloroma, and would lay most stress upon the

localization, the great aggressiveness, the tendency to infiltration, and the rapid course.

Weinberger says that in his case the anatomic diagnosis of Weichselbaum was: Lymphatic leucemia, leucemic lymphoma, chloroma. He thought it differed from lymphosarcoma of Kunderat in that the lymphoid nodes, notwithstanding their extent, remain in the place of primary growth, and do not infiltrate the adjacent tissue. It resembles lymphatic leucemia in the nodular foci in the mucous membranes, the serosa, peritoneum, liver, spleen, and bone-marrow, and in the blood picture.

Türk objects to the separation of leucemia, and especially lymphatic leucemia, and lymphosarcoma, and insists on the occurrence of transition stages from one to the other. According to him, chloroma is a local lymphosarcoma, a malignant lymphoid hyperplasia, with or without lymphemia. He alludes to the intramuscular infiltration as an evidence of the malignant character of the disease. The differences in blood pictures can be explained by the affection of the bone-marrow.

While there are some contradictions and differences of opinion regarding the growths among those who have examined cases of chloroma, I think it can be said that histologically most of them have a structure that can best be compared with that of the leucemic lymphomata. That certain variations occur, however, seems beyond question, and I believe that Dr. Warthin's examinations in this case reveal some important demonstrations of this fact.

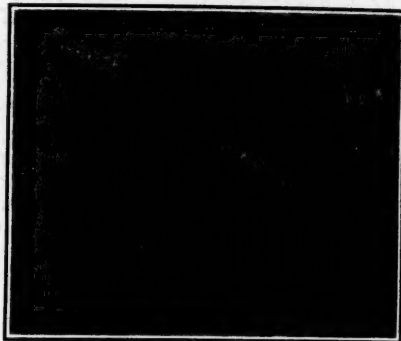
MICROSCOPICAL EXAMINATION BY DR. WARTHIN.

Preparation. In the preparation of the material for microscopic examination alcohol, formalin, mercuric chloride, Zenker's, Müller's, and Flemming's were used as fixing and hardening agents. Some of the material was also examined in the fresh state. A portion was fixed and embedded in formol-agar. The greater part was embedded in paraffin. Celloidin embedding was used for a few tissues and for the material fixed in Flemming's. A great variety of staining methods was employed: hematoxylin and eosin, Van Gieson's, carbolthionin, Wright's, Romanowsky's, Jenner's, kresyl echt-violet, polychrome methylene blue, triacid, Weigert's fibrin, Weigert's yellow elastic, Mallory's reticulum, etc. Sudan III was used for fresh material and for sections cut in formol-agar. Potassium ferrocyanide and HCl were used for the iron test. Ebner's fluid was used for decalcifying the vertebrae.

Prevertebral Green Tissue.—Sections cut at right angles to the surface of the prevertebral green tissue show that the upper portion consists of adipose tissue and the lower portion of the dense connective tissue of the prevertebral fascia and periosteum, both being densely infiltrated with cells that in general correspond to the cells found in the blood as described above. The infiltration of the denser connective tissue is arranged in rows or cords of cells extending in the

lymph spaces and blood vessels between the parallel to the dense fibers of the reticulum. In the adipose tissue the infiltration is more irregular and the cords of cells proceed in all directions between the fat cells. In many places the latter are atrophic or have entirely disappeared, their places being taken by masses of new cells. In the denser parts of the periosteum the cells are often

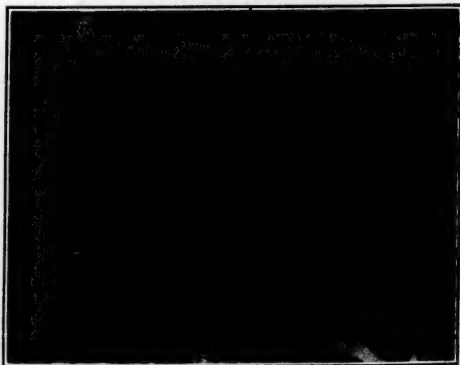
Fig. 1.



Blood showing differences in size, shape, and relative size of nucleus and amount of protoplasm in the lymphocytes.

arranged in rows of single file, and are elongated, often spindle-shaped. In the looser fat tissue and in the lymphatics and blood vessels the cells are usually round or oval. The majority of the nuclei are somewhat larger than a red blood cell, stain moderately deeply, or are pale and have a distinct, finely filamentous network of chromatin. In general the nuclei are round or elongated ac-

Fig. 2.

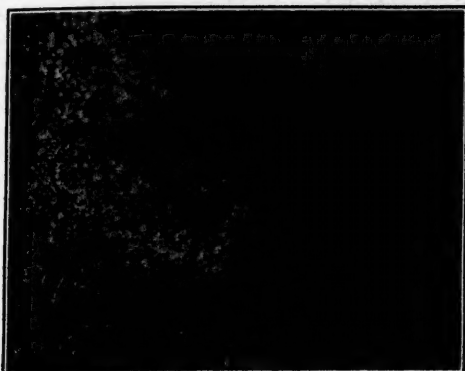


Vertebra periosteum and adjacent tissue.

cording to the situation in which they are found, but they are also frequently indented, saddle-bag shaped, bilobed, or divided completely into two. In the cells having two nuclei the latter are often somewhat smaller than the nucleus of the mononuclear forms, stain a little more deeply, and have coarser chromatin threads. The appearances sometimes suggest a recent mitotic division.

The majority of the cells of the infiltration possess a small rim of protoplasm varying in thickness, and usually more prominent at one side of the cell. Other cells have a more abun-

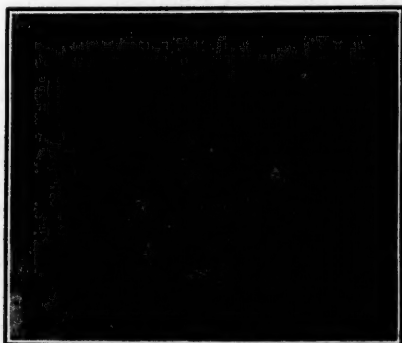
Fig. 3.



Prevertebral green tissue. Periosteum and fat infiltration.

dant protoplasm, but many show no protoplasmic rim at all. On the whole the proportion of cells showing a distinct protoplasmic body is greater in the infiltration than in the blood. The most striking feature of the infiltration is the fact that the majority of cells having a well-marked protoplasmic rim contain *eosinophile granules*. These granules for the greater part are in all respects

Fig. 4.



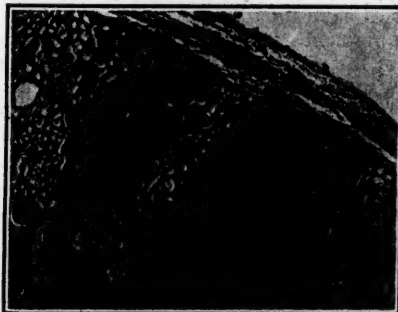
Primary growth showing large proportion of eosinophile cells. High power.

apparently identical with the granules of ordinary eosinophile cells; they are of the same size, possess the same staining reactions, and in unstained fresh sections appear as greenish-yellow, refractive granules. In some cells the eosinophile granules are fewer, smaller, and paler. A small proportion of cells have a neutrophile granulation, and a smaller number still have a distinct basophile granulation. Apparent transition forms between these are sometimes found. In those cells possessing no granulation the protoplasmic rim is either colorless or at times stains faintly with

the nuclear stain, at other times with eosin. Apparent transition forms are seen between the cells without granulation and those with numerous eosinophile granules.

In the majority of fields the number of the numerous eosinophiles is so great that a red tint is given to the section. In some fields every cell may show eosinophile granulation; few fields exist without some eosinophile cells, while in the great majority of fields the proportion of eosinophile cells by actual count runs from 50 to 75 per cent. While from the numerous transition forms found everywhere there can be no doubt

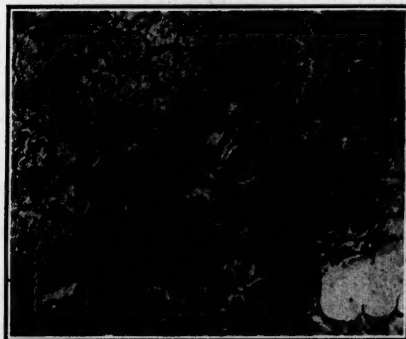
Fig. 5.



Metastases in kidney.

that the eosinophile cells are derived from the large "lymphocytes" of the infiltration, it is impossible to distinguish those eosinophile cells having an abundant protoplasm from the eosinophile myelocyte. Few polymorphonuclear eosinophiles are found in the infiltration. In the denser portions of the periosteum the number of eosinophiles is not so great as in the looser connective tissue and adipose tissue. Many of the spindle-shaped cells in the former, however, show eosinophile

Fig. 6.



Metastases in lung. Pulmonary vessel filled with atypical lymphocytes.

granules. On the whole, the eosinophile cells show no special grouping with reference to the blood vessels.

Mast-cells are few or entirely absent. Few polymorphonuclear leucocytes are seen, and are

easily distinguished by their more deeply staining nuclei. Some of these are also eosinophilous. Typical small lymphocytes are also rare. No giant cells or phagocytes found. Few mitoses seen (this may be accounted for by the long time elapsing between death and autopsy), although numerous appearances suggest clumped mitoses. The transition forms of indentation, constriction, and complete division of the nucleus suggest amitotic division. Mitoses were twice seen in cells with eosinophile granulation.

Evidences of degeneration of individual cells are present in the form of pycnosis and karyorrhexis, but definite areas or centers of degeneration are not seen. A few cells containing small vacuoles were found.

No pigment granules are present in any of the cells of the infiltration. The iron test was negative in so far as these cells were concerned. The treatment with osmic acid was also negative. The staining of fresh sections with Sudan III

or are represented by granules of iron-containing pigment. As mentioned above, no red cells or blood pigment of any kind occur within the cells of the infiltration. The reticulum of the infiltration is chiefly or wholly that of the original tissues, but there is undoubtedly some increase of reticulum both in the periosteum and denser fascia as well as in the adipose tissue. There is also some thickening of the walls of the medium and larger-sized blood vessels, and an endothelial proliferation of the smaller. As a rule the walls of the large vessels show but little or no infiltration by the new cells.

The infiltration behaves in all respects as a *tumor infiltration*. The original tissues are either crowded apart, compressed, or have become atrophic. Such changes are seen particularly in the case of nerve trunks and ganglia. The spinal nerves and ganglia show especially the results of such infiltration and compression. In the case of ganglia that are completely surrounded by the infiltration and ganglion cells are atrophic and present various appearances of degeneration. The nerve trunks show an infiltration along the blood vessels and lymphatics.

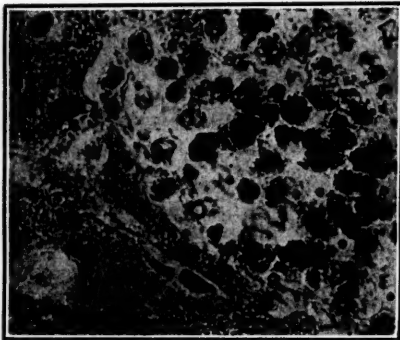
The general picture presented microscopically by sections of the prevertebral green tissue is that of a *tumor infiltration in which the cells are of the type of large lymphocytes or myelocytes, the majority showing eosinophile granulation*.

Smears of the Prevertebral Green Tissue.—Smears stained with hematoxylin and eosin, Wright's method, and the triacid show that the cells are chiefly of the "large lymphocyte" type as found in the blood of this case. The majority have no protoplasmic rim. Many show eosinophile granulation. Clumped and fragmented forms are numerous and many of the nuclei are vacuolated. Few red blood cells are found in the smears.

Green Tissue from Sternum.—The microscopical study of this shows precisely the same structure and character of infiltration of the periosteum and overlying fat and connective tissues as in the case of the prevertebral green tissue. If there is any difference the number of eosinophiles is greater. Smears from this tissue show the same "large lymphocyte" type of cell, the majority eosinophilous.

Bone-Marrow.—Sections of the sternal marrow show that the normal marrow elements are almost wholly replaced by cells of the same type as those of the periosteal infiltration—that is, by cells of the large lymphocyte type, the majority showing eosinophile granulation. No bone-marrow giant cells are seen. Very few red blood cells are present and only two cells were found that could be regarded as nucleated red cells. Few neutrophile myelocytes are present and small lymphocytes and polymorphonuclears are also very few in number. Transition forms between the large lymphocytes with small protoplasmic rim and those with more abundant protoplasm containing eosinophile granules are numerous.

Fig. 7.



Small metastasis in liver, showing many eosinophile cells. High power.

showed fat droplets in the cells of the reticulum, but not in those of the infiltration. In some areas a very slight diffuse orange was imparted to the cell protoplasm. In the fresh sections the eosinophile granules were seen distinctly as refractive, shining granules having a distinct greenish-yellow color. No other evidence as to the source of the green color of the tissue could be obtained.

There are no positive evidences of the formation of new blood vessels in the infiltrated tissues. On the other hand, these appear poorly vascularized, the blood vessels being apparently those of the original tissue and more or less filled with cells of the same type as those of the infiltration. Very few red cells are seen in the vessels. Under the high power red blood cells may be seen in small numbers scattered throughout the reticular spaces in company with the new cells. It is difficult to decide whether these represent small hemorrhages or whether the red cells lie in blood vessels which are more or less obturated by the new cells. Evidences of red-cell destruction are present in some places, the red cells lying in association with the new cells showing fragmentation,

Inasmuch as the eosinophile "large lymphocyte" passes by transition forms into cells morphologically identical with eosinophile myelocytes, this fact may be taken as evidence of the derivation of the latter type of cell from the former. The eosinophiles are somewhat unevenly distributed; in some fields 50 to 80 per cent. of all nucleated cells may show eosinophile granulation, in others the proportion may drop to 10 to 20 per cent., but in many sections the majority of fields show a preponderance of eosinophiles. The polymorphonuclear eosinophiles are relatively very few. The nuclei of the majority of the eosinophiles in general resemble those of the non-eosinophile large lymphocytes. All possible transition forms exist between such eosinophiles and those forms with more abundant protoplasm resembling eosinophile myelocytes. In their general characteristics, size, shape, pale nuclei, small amount of protoplasm, etc., the cells constituting the mass of the sternal marrow are identical with those of the periosteal infiltration. The capillaries and blood vessels of the marrow are nearly completely obliterated by cords and masses of cells of the same type. The delicate reticulum of the marrow appears to be but slightly increased.

Smears of Sternal Marrow.—Smears of the sternal marrow fixed in absolute alcohol and ether and stained with hematoxylin and eosin, triacid, etc., or fixed and stained by Wright's method are composed almost wholly of cells of the "large lymphocyte" type, the majority containing eosinophile granules. Numerous large eosinophile cells with very pale, large, single nuclei are also present. These resemble eosinophile myelocytes; many of the nuclei are vacuolated. There is a great variation in the size of the eosinophiles, and numerous transition forms exist. The majority of the non-eosinophiles have little or no protoplasmic rim and correspond with the cells found in the periosteal infiltration and in the blood vessels. The nuclei of these also show vacuoles of varying size. Numerous degeneration forms are present. The smears contain but a few red blood cells and only a very few nucleated reds. The background of the smears is made up to a very large extent of free eosinophile granules.

Vertebral Marrow.—Sections of decalcified portions of the bodies of the vertebræ show an enlargement of the marrow spaces and a rarefaction of the bony trabeculae. The enlarged marrow spaces are filled with closely crowded cells of the "large lymphocyte" type identical with those found in the sternal marrow, prevertebral and sternal periosteal infiltrations, and in the blood vessels. The number of cells having a rim of protoplasm is somewhat greater than elsewhere, and many cells show a distinct cell body. There are also more degenerating forms. The eosinophile cells are not quite so numerous as in the sternal marrow or the periosteal infiltrations, but nevertheless in the majority of fields form a relatively high proportion of all cells present. In the portions fixed in Müller's fluid the proto-

plasm of the majority of the cells replacing the marrow elements is distinctly chromaffinic to some extent, having a distinct brownish or greenish-yellow color. There are but few red cells and no nucleated red cells were found. The polymorphonuclears and small lymphocytes are relatively very rare. No bone-marrow giant cells were seen and no plasma or mast-cells found. Owing to the fixation used the neutrophile cells could not be distinguished. In some of the large lymphocyte forms having an abundant protoplasm, very small and light eosinophile granules are present. The reticulum of the marrow is apparently slightly increased and consists of fine fibrillae.

The most important fact determined in regard to the relationship between the marrow condition and the prevertebral infiltration is the demonstration of the direct connection existing between the two. Sections made through the prevertebral green tissue and periosteum, and extending into the body of the vertebra show that the large masses of cells in the enlarged marrow spaces are in many instances directly continuous with the periosteal infiltration by means of relatively large openings in the bone. Smaller cords of cells extend from the marrow spaces through small openings in the bone and are continuous without break with the periosteal infiltration. Such direct continuity between the marrow spaces and the periosteal infiltration are so numerous that they can be seen in nearly every section. The openings are most probably enlarged lymphatics or blood vessels. Red cells occur in some of them in association with the cells of the large lymphocyte type. In other cases the growth of cells in the medullary spaces appear to have caused a disappearance of bone and a direct extension of cell growth outward into the prevertebral tissues. The infiltration from the vertebræ does not extend into the intervertebral disks and is scanty over them. It surrounds the body of the vertebra more or less uniformly, but is most marked at those places where it is continuous with the growth in the marrow spaces. In some places masses of cells have grown or collected beneath the periosteum, raising it from the bone. The various pictures presented suggest growth outward from the bone and not from without into it. The spinal nerves and ganglia are surrounded by the infiltration and are to some extent themselves infiltrated. There is an increase of interstitial connective tissue within some of the ganglia.

The careful study of such sections leads to the conviction that we have to deal here with a *primary growth within the marrow spaces which infiltrates or grows directly through the lymphatics and blood vessels or breaks through the bone and secondarily involves the periosteum and surrounding tissues.* The cells of this growth are identical morphologically with the so-called large "lymphocytes," large mononuclears, and eosinophile myelocytes of the normal bone-marrow.

Smears of Vertebral Marrow.—Smears of the

vertebral marrow fixed in absolute alcohol and ether and stained with hematoxylin and eosin, triacid, etc., or fixed and stained with Wright's, present the same picture of those obtained from the sternal marrow. Few red cells are present, and no nucleated forms were found. The number of eosinophiles appears not so great, and there is a larger proportion of degenerating forms. The majority of the nuclei have either large or small vacuoles, many nuclei consisting of a large vacuole having only a faint rim of chromatin. Numerous nuclear forms suggesting clumped mitoses are present as well as those forms suggesting amitotic division. The background of the smears is made up chiefly of eosinophile granules. Numerous very pale nuclei covered with eosinophile granules and having no protoplasmic body are seen.

(To be Continued.)

MEDICAL PROGRESS.

MEDICINE.

Ainhum.—H. N. BLUM (*Med. Record*, October 22, 1904) reviews what is known concerning this peculiar disease, and cites a series of typical cases from the literature. The affection occurs almost always amongst the dark-skinned races of tropical and subtropical regions, and is characterized by a progressive constricting sclerotic ring around the bases of the digits of the hand or foot, especially selecting the little toe of either or both feet and ending in a gradual amputation of that portion of the affected member distal to the constriction. The condition is local, there being no manifestations except on the toes or fingers, and it never recurs at the site of amputation. It is sometimes confused with leprosy or Raynaud's disease, but may be differentiated from these by its duration, its purely local nature, the characteristic "scleroderma" and the absence of the specific bacilli of leprosy. Very little is known as to its cause, and the author agrees with Matas in terming it a trophoneurosis. His own case occurred in a negress of sixty-five years, whose right little toe was affected in the characteristic way. The toe was disarticulated at the metatarsophalangeal joint under cocaine anesthesia, and the cicatrix has since remained in healthy condition.

Rhythmical Mechanical Compression of the Thorax in the Treatment of Dyspnea.—Various drugs and also mechanical or manual compression have been used for the treatment of conditions in which the chest does not perform proper excursions, but none, according to D. BOGHEAN (*Berl. klin. Woch.*, October 17, 1904) have been entirely successful. Any form of apparatus with which it is desired to deepen the respirations, must neither wear out the patience nor the strength of the patient or operator, and in order to be regular and constant in its action, must be kept in motion by a suitable motor and easily regulated. The author has devised a rather complicated apparatus which is believed to fulfil these requirements. It is driven by a small electric motor and the active principle consists of a pair of pads which compress the patient's chest, after the machine is set in motion, during the act of expiration, so that a greater volume of air is expressed from the person's lungs than would occur with his unaided efforts. This is believed to increase the carbon dioxide output and thus relieve the subjective sense of dyspnea. The question as to whether it

is the lack of oxygen or the accumulation of carbon dioxide which causes the dyspnea in any given case is answered by the observations of a host of writers who claim that both are at fault, but that the organism is much more tolerant toward a lack of oxygen than toward an excess of carbon dioxide.

Osteomalacia and Thyroid Disease.—The not uncommon association of osteomalacia with disease of the thyroid gland—myxedema, tetanus, and especially Basedow's disease,—have led to a series of observations by E. HÖNICKE (*Berl. klin. Woch.*, October 31, 1904) which seems to show that osteomalacia may be traced to a primary disease of the thyroid. He has studied the geographical distribution carefully of both diseases and has also noted that the thyroid gland in osteomalacia was abnormal and that in the latter condition, symptoms of thyroid disease were also present. It is probable that a primary disease of the thyroid glands leads to a disturbance of the phosphorus metabolism, which is the main characteristic of osteomalacia. The various forms of the latter constitute a disease entity, and the peculiarities of the puerperal form may be explained on physiological grounds. The operation of castration is effectual because it diminishes the loss of phosphorus, and the administration of phosphorus is of value because it increases the amount of phosphorus. The author is about to publish a more complete account of his observations of which this is merely a preliminary communication.

Artificial Pernicious Anemia.—By repeated injections of pyrogallic acid into animals, grave blood-changes may be brought about which in many ways resembles pernicious anemia. In a series of experiments, P. RECKZEH (*Zeitsch. f. klin. Med.*, Vol. 54, Nos. 3 and 4) found marked reduction of hemoglobin and red cells, poikilocytosis and the appearance of nucleated erythroblasts. An advanced degree of anemia is, however, necessary for the appearance of megaloblasts. If an examination of the bone-marrow be made, changes typical for pernicious anemia may also be found. A marked leucocytosis is also a pronounced symptom; at first the polymorphonuclear elements, especially the younger forms with single, indented nucleus predominate, later, the lymphocytes are decidedly more abundant, indicating general failure on part of the bone-marrow. All these changes correspond to observations made on the blood of cases of pernicious anemia in man. Strangely enough, if young animals are selected for experiment, the composition of the blood resembles that of the anemia pseudoleucemia infantum of v. Jaksch in that the leucocytes are enormously increased and the relation of whites to reds frequently reaches 1 to 12. It is probable, therefore, that this disease is closely allied to pernicious anemia and the leucocytes are more numerous solely because the bone-marrow of the young reacts more strongly to irritation. This is corroborated by the observation that the polymorphonuclear cells predominate.

Gastric and Intestinal Crisis.—In all cases of gastric and intestinal crisis of tabetic origin observed by C. A. EWALD (*Centralbl. f. d. gesamt. Therapie*, October, 1904), other symptoms of tabes were also present. Common eye symptoms were pupillary rigidity, paralysis of the external muscles of the eye and optic atrophy. Difference in the size of the two pupils is not so valuable since it may occur in other conditions and even in health. It must not be forgotten that pupillary rigidity may also be an early symptom of multiple sclerosis, cerebral syphilis or tumor, general paresis and even alcoholic neuritis. It is, therefore, wrong to diagnose tabes from only one or two symptoms. Westphal's sign

is of great importance, but it has been known to disappear and then to reappear in the later stages. Disturbances of sensation, especially about the lower extremities, are only rarely absent and sometimes paresthesia in the posterior pharyngeal wall on the anal mucous membrane are complained of. In the cases observed by the author, a history of syphilis was obtained in 62 per cent. The average duration of the disease was two years and ten months. A period of a year and a half may lie between the first attacks, but later they increase in frequency and may appear daily. The duration of each separate attack varies between one-half to forty-eight hours. Their onset is very sudden with epigastric cramps and nausea, soon followed by severe and extremely painful emesis. An aura in the form of pain in chest and back is sometimes observed. As soon as other tabetic symptoms make their appearance, the crises usually lose their intensity. The condition of the gastric juice varies, but diminished acidity seems to be the rule. Constipation is not rarely present. Rectal crises manifest themselves in intense tenesmus with the discharge of only slight amounts of feces and mucus. They are less frequent and never occur together with gastric crisis. The treatment is very unsatisfactory and morphine can hardly be dispensed with, since there is as yet no specific. Recently, epidural injections of cocaine have been employed with good result.

THERAPEUTICS.

Treatment of Laryngeal Tuberculosis.—Laryngeal tuberculosis without its pulmonary congener is very rare, and in cases where examination of the lungs fails to elicit the symptoms of pulmonary invasion NIKITIN (*Prakt. Vrach*, No. 39, 1904) thinks that the changes in the lungs are so deep-seated and limited as to escape for the time being objective examination. The results of the treatment as based on observations of 1,732 cases, are never permanent, but a temporary benefit is undoubted. Thus in one case of infiltration of the arytenoid cartilage the author succeeded in bringing about cicatrization of the ulcer with subsequent complete cure of the patient; who seven months later, however, died of tuberculous meningitis. In another case treatment of the larynx by curettage followed by the application of lactic acid and general constitutional treatment has so far improved the patient's condition that he was enabled to resume and continue his avocation, that of a teacher, for two years; he succumbed, however, to pulmonary tuberculosis, although he never complained of laryngeal trouble again. The treatment is either medicinal or surgical. The medicinal means are either antiseptic or analgesic. In hypersensitive patients the treatment should be limited to inhalation or insufflation of solutions or powders. The author finds an excellent palliative in one-half per cent. solution of nirvanin followed by the insufflation of orthoform or di-iodoform. If the infiltration is limited and the course of the pulmonary affection slow, curettage may be resorted to, to be followed by the application of lactic acid. Laryngeal ulcers are to be treated by inunction with solutions of lactic acid, phenol-glycerin, parachlorphenol or phenosallyl. The more superficial the ulcers the easier they admit of application. Phenol, when dissolved in glycerin, yields completely its burning quality and may therefore be applied in concentrated solutions. A transient stage between the medical and surgical treatment is to be seen in the application of galvanocaustics and electrolysis. Tracheotomy as recommended once by M. Schmidt,

was at first received favorably, but it was gradually pushed into the background, for to be successful it must be employed early in the disease, when the patients rather prefer milder treatment. Moreover, tracheotomy is objectionable on the ground of constant irritation as induced by the presence of the canula, the possible risk of necrosis of the tissues, the predisposition to infection, and the difficulty which is presented to the expulsion of the pulmonary secretion. More is to be hoped from tracheotomy in conjunction with curettage of the tuberculous infiltrations by the aid of a sharp spoon, in cases that are not very far advanced. The operation enables one to do the curettage in an open field, and not through the mouth, which presents considerable difficulties. Thus in a girl, aged nineteen years, a laryngotomy was performed after a preliminary tracheotomy, and after opening the larynx the infiltration on the posterior wall of the larynx and ulcers on the left vocal cord were curetted and then treated by galvanocautery. The laryngeal wound was then closed. The pain on deglutition was gradually diminished, and on the sixth day when the canula was taken out, patient was able to swallow freely. The postoperative course ran smoothly. Later, she completely recovered, but the voice remained hoarse, and examination of the larynx elicited the presence of cicatrices at the sites of the ulcers. At present, at the expiration of two years, patient still enjoys excellent health.

Treatment of Leucemia with Roentgen Rays.—One case of myelogenous leucemia was treated daily by the Roentgen rays for one month by D. FRIED (*Munch. med. Woch.*, October 4, 1904). The daily exposure was three to fifteen minutes. At the end of the treatment, the leucocytes had fallen from 62,000 to 6,000, the spleen was considerably smaller, the patient's weight had increased and subjective symptoms were no longer complained of. His improvement still persisted a month and a half later. Similar good results were observed in a second case. It has been proven by animal experiments that cells of the spleen and lymph-nodes are readily absorbed under the influence of the Roentgen rays and early cases of leucemia are entirely benefited more than by anything else. It is still too early to say if the improvement is permanent or if advanced cases are also influenced.

Sprain and its Treatment.—G. NORSTROM warmly advocates (*Med. Rec.*, November 19, 1904) early massage and active and passive motion in cases of sprain. If physicians paid more attention to this method of treatment they would keep many patients out of the hands of "bone setters" and other quacks. Properly applied massage often cures in one or two cases that under the old treatment by immobilization would consume weeks. The massage first applied should be very gentle, so as not to cause irritation or too much pain, and then gradually be increased as the tension of the tissues subsides. Not until the inflammation has become less intense is it advisable to introduce real frictions. At first the sittings should be protracted, of at least twenty minutes' duration, and should, when possible, be repeated several times a day. The treatment may be summed up as follows: (1) At the initial stage, in the presence of classical phenomena, including a great deal of pain, effleurage. (2) When the pain has decreased a great deal frictions and passive movements; later, active movements. Walking at the beginning ought not to be permitted. (3) In all sprains of the lower

extremities, after every séance, application of a gauze bandage, a precaution all the more indicated when the patients are allowed to use their legs and walk. (4) In order to prevent real relapses, as well as to prevent the inflammation taking on a chronic character, the treatment ought to be kept up until complete restitution has taken place.

Oxygen in Combination with the Different General Anesthetics.—J. T. GWATHMEY publishes (*Med. Rec.*, November 19, 1904) the results of an extensive series of observations made to determine the value of oxygen as an addition to general anesthetics. The conclusion reached is that oxygen increases the value of anesthetics as regards life, without decreasing their anesthetic effect. The author's investigations were made upon a series of one hundred cats, chosen so as to present as little variation in size, etc., as possible. The animals were killed by means of the various anesthetics in common use, administered by means of a closed mask and with the admixture or either air or oxygen, the time required being noted in each case. As a result of the figures so obtained the author says that, regardless of the anesthetic used, animals have lived twice as long with oxygen as when air was used. They usually die quietly with oxygen, and in convulsions with air. With oxygen the heart also continued to beat longer after respiration ceased. Efforts at resuscitation are more likely to be successful when oxygen has been used, and in private practice the after-effects of the anesthetic are reduced by this means. The experiments show that a mixture of chloroform and oxygen is more than twice as safe as chloroform and air, and is also safer than any of the other general anesthetics with air. This means that instead of having a very high mortality, chloroform given with oxygen is now as safe as ether. But all of the other general anesthetics are also increased in value by oxygen, and the use of this method of administration practically eliminates the percentage of danger which has hitherto been recognized as inseparable from the practice of anesthesia.

Thiocol and Sirolin.—Very good results are reported by D. SZABOKY (*Wien. klin. therap. Woch.*, October 16, 1904) from the use of thiocol and sirolin (a solution of thiocol). The former drug is given in doses of 0.5 gram four times daily, and incipient cases of tuberculosis are often cured or considerably benefited in four to six weeks. Even in advanced cases the cough is alleviated, the temperature reaches normal, and the appetite improves remarkably. In intestinal tuberculosis, thiocol has a very good effect, since it seems to be possessed of almost specific action upon the intestines. In laryngeal tuberculosis it may be applied locally with good result.

PRESCRIPTION HINTS.

Treatment of Pruritus Ani.—At the recent meeting of the British Medical Association Dr. Malcom Morris spoke on this subject. Pruritus ani, he said, is often very refractory to treatment, but the practitioner should never despair, as few cases are incurable, though many will tax his therapeutic ingenuity to the uttermost limit. The first thing to be done is to seek for the cause, and remove it or neutralize its action. Each group of cases—that is to say, those dependent on constitutional disorders, those produced by reflex disturbances, those due to a local condition, and those that are the expression of a neurosis—must be dealt with by measures appro-

priate to the causation. There are certain principles of therapeutics applicable to each of these several groups; but in the details of treatment each case must be dealt with in accordance with its special features and with the idiosyncrasy of the patient. In all cases, therefore, a careful examination, general and local, must be made before any system of treatment is instituted. The following formulæ have proved useful in his hands:

℞ Acid. carbolic ℥xx
Cocaine hydrochlorat. gr. x
Vaselin 3 j

Fiat ung.

℞ Acid. carbol. 3 ss
Cocainæ 3 ss
Aq. laurocerasi 3 j
Aq. Rosæ 3 iiij

Fiat Lot.

℞ Acid. carbol. 3 ss
Hyd. perchlor. gr. ij
Ol. olivæ 3 ij
Ung. zinci oxid. benzoat. ad. 3 j

Fiat ung.

Tarry preparations are useful. The sapo carbonis detergens may be used for ablutions; the lotio picis carbonis may be employed in calamine lotion as a vehicle (3 ij of the former to 3 viij of the latter). Tar, combined with bismuth, may also be applied in the form of an ointment, composed as follows:

℞ Ung. piois liquidæ 3 j
Bismuth subnitrat. gr. xx
Adipis ad 3 j

Fiat ung.

Compresses soaked in oil of cade are often very useful. Peruvian balsam in vaselin is a good application. A suppository of extract of belladonna (½ gr.) at bed-time, will often prevent the nocturnal exacerbation. Painting the part with lead in spirit and water is a soothing remedy. Nitrate of silver in sweet spirits of nitre (gr. iij to 3 j) is often useful. Among other sedative remedies which may be tried are menthol, ichthyol, chloral hydrate, borax, benzoin, and tincture of iodine. When piles are the cause of the trouble, the unguentum gallæ will often relieve the itching as well; painting or injecting with hamamelis is also useful for the same purpose. Oxide of zinc is best applied in the form of a cream as follows:

℞ Zinci oxidi 3 ij
Lanolini 3 ij
Ol. olivæ 3 ss
Aquæ calcis 3 ss

Among antiseptics, the most useful is mercury. A very convenient form is the oleate, which may advantageously be combined with oleate of morphine. An ointment composed of calomel 3 ss to an ounce of vaseline is also serviceable. Black wash is particularly useful; it may be used either alone or in a vehicle of mucilage or tragacanth as follows:

℞ Lot. nigræ } 3 iv
Liq. calcis }
Mucilag. tragacanth 3 j

Another useful mercurial lotion is the following:

℞ Hyd. perchloridi gr. ij
Glycerini 3 ss
Aq. chlorof. ad 3 iiij

Ammoniated mercury in benzoated lard (gr. xx. ad 3 j) is also valuable. Calomel in powder may render excellent service.

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FOOD PRESERVATIVES AND ADULTERANTS.

At the last meeting of the New York Academy of Medicine, Dr. H. W. Wiley, the Chief of the Bureau of Chemistry of the United States Department of Agriculture, read a preliminary report with regard to the influence of preservatives and adulterants in food upon the public health. A very full abstract of his interesting paper will be found in our Society Proceedings for this week. The full report, consisting of over 500 pages of printed matter, is to appear shortly.

The most interesting feature of the report is the thoroughgoing conservatism with which the subject has been approached and the judicial straightforwardness with which the conclusions are presented. Nothing is said that would give material for a scare head or a sensational news item, and accordingly, Dr. Wiley's report did not occupy the attention of the daily papers in any large degree. What has been lost in sensation, however, has been gained in scientific value, and there is no doubt that as Americans we may feel proud of the fact that the government investigations have been conducted in a manner so worthy of American science.

That even such mild preservatives as boric acid and borax may be a source of some danger, when

constantly used in food, there can no longer be any doubt. The American investigators, however, did not find any of the serious effects that were claimed to have been observed in Germany. The various boric derivatives cause distinct disturbance of metabolism, a lessening of nitrogenous waste and an increase in the phosphate elimination. These are of themselves quite sufficient to deter those who are at all anxious about their health from the frequent use of food containing such preservatives. One effect always produced is a lessening in the weight of those who have partaken of these materials, either in large quantities for a short time, or in small quantities for a longer period. As a matter of fact, as was pointed out in the discussion, boric acid has long been recognized by conservative clinicians as one of their best remedies for adiposity.

The only serious danger seems to be from the possibility of kidney irritation. There is no doubt that nephritis is on the increase in this as well as the boric acid taken with food is excreted through in most other civilized countries. Four-fifths of the kidneys. The remaining fifth is eliminated by the sweat glands, and thus grows a burdensome duty upon portions of the excretory system which are the best auxiliaries to the kidneys. There is no doubt, however, that other preservatives, such as saltpeter, are much more irritant to the kidneys, and yet have been used in the making of brine for many years, apparently without producing any serious effect and certainly without arousing exaggerated fears of possible evil results.

The whole subject deserves the conservative treatment it received at the hands of the Department of Agriculture and the only suggestion is not that the use of such preservatives should be forbidden by law, but that whenever their presence is considered necessary a label should be affixed to the food materials to indicate that fact. We have had much of sensational newspaperism with regard to this whole subject. It is refreshing to find it treated so calmly and judiciously, and at the same time so thoroughly and with such scientific completeness.

CEREBROSPINAL CYTODIAGNOSIS.

WHILE cytodiagnosis, so far as the examination of pleural exudates is concerned, has now a well-established basis, and constitutes one of our most valuable diagnostic methods, the same

can hardly be maintained in the case of the cerebrospinal fluid. When it was shown at first that tuberculosis of the pleura, and this only, led to lymphocytosis of the corresponding exudate, it was thought that meningeal tuberculosis would give rise to a similarly specific result. As a matter of fact, evidence was soon forthcoming that tuberculous meningitis, in contradistinction to the ordinary form, was associated with an increased number of lymphocytes in the cerebrospinal fluid, but further investigation showed that this symptom could in no sense be regarded as specific. For, on the one hand, cases of meningeal tuberculosis were reported in which polynuclear neutrophils predominated, while on the other lymphocytosis was observed in many non-tuberculous cases. It was thus found quite frequently in progressive paralysis and tabes, in cerebrospinal lues, in syphilitic hemiplegia, as also in uremia and tetanus, and still other conditions.

The explanation of this more generalized occurrence of lymphocytosis in the cerebrospinal fluid was sought in the element of a supposed meningeal irritation. It is to be noted, however, that in cases of apoplexy of non-syphilitic origin (which the Germans very appropriately term "Alters Apoplexie") no lymphocytosis occurs, even though most marked symptoms of irritation exist. In syphilitic hemiplegia, on the other hand, an increased number of lymphocytes is apparently constant. The conclusion therefore would seem quite justifiable that the syphilis and not the hemiplegia is the deciding factor in the production of the lymphocytosis.

Niedner and Mamlock, in a recent communication from v. Leyden's clinic, have published a series of observations which tend to throw new light upon this question. They point out that the lymphocytosis, which is observed not only in syphilitic cerebrospinal affections, but in syphilis in general apparently, as also in uremia and tetanus, suggests that intoxications may play a prominent rôle in its production, especially if a virus should be operative which is constantly present or renewed, and which produces a continuous irritation of the central nervous system. This assumption would also explain the absence of lymphocytosis in epilepsy which, barring Merzbacher's statement to the contrary, appears to be the rule. Experiments on rabbits, in which convulsions were produced by means of strychnine, lend support to this view.

That an intoxication in itself, however, is

not necessary, and that the time element is even more important is shown by the observation that lymphocytosis may also occur in certain cases of brain tumor, and Niedner and Mamlock suggest that in the traumatic cases of epilepsy reported by Merzbacher, in which the lymphocytes were found increased, the result was probably referable to prolonged and intense stimulation. Experiments in this direction likewise yielded positive results. Meningeal irritation, accordingly, if of any moment at all in the production of lymphocytosis, can only be regarded as a factor of secondary importance.

Viewed from the standpoint of diagnosis, the examination of the cerebrospinal fluid thus appears somewhat disappointing in its general aspects. That it may furnish information of value, however, is undoubted. Further investigations are now urgently needed to ascertain the earliest period of syphilis at which lymphocytosis will occur, and to determine the phases of the disease with which it is associated. That it may be demonstrable at a time when secondary symptoms already exist (ulcus durum and exanthem) appears certain.

ECHOES AND NEWS.

NEW YORK.

Dr. Sachs Leaves the Polyclinic.—Dr. B. Sachs has resigned his position as Professor of Neurology in the New York Polyclinic Medical School.

Eastern Medical Society.—At the annual meeting of the Eastern Medical Society, to be held at Clinton Hall, December 9, an address will be delivered by Dr. A. Jacobi. The Genito-Urinary Section of the Eastern Medical Society will meet on Tuesday, December 6, at 8.30 P.M., at Clinton Hall, 151-153 Clinton Street, Manhattan. Program: Five-minute papers on "Syphilis, as Observed in General Practice." (1) Syphilis of the Nose and Throat, by I. Grushlaw, M.D.; (2) Syphilis of the Eye, by A. A. Himowich, M.D.; (3) Syphilis in Obstetrics and Gynecology, by E. K. Browd, M.D.; (4) Syphilis of the Nervous System, by Emil Altman, M.D.; (5) Syphilis of the Viscera, by L. F. W. Haas, M.D.; (6) Syphilis in Surgery, by Chas. Goodman, M.D.; (7) Syphilis in Pediatrics, by A. Hymanson, M.D.; (8) Pathology and Diagnosis of Syphilis, by Ludwig Weiss, M.D.; (9) Treatment of Syphilis, by Daniel A. Sinclair, M.D. Discussion by Drs. S. Lustgarten, Charles Warrenne Allen, Samuel W. Brickner and B. Lapowski. The profession is invited.

Annual Meeting of Skin and Cancer Hospital.—The following officers were elected at the twenty-second annual meeting of the New York Skin and Cancer Hospital at Nineteenth Street and Second Avenue: President, J. Cleveland Cady; Vice-President, William C. Witter; Secretary, L. Duncan Bulkley; Treasurer, Edward Winslow. The hospital has administered during the past year to some five thousand patients.

Health Board Dairy Inspection.—The plan suggested by James P. Atkinson, chemist of the Health Department, seeking to get at the root of the adulteration evil, provides that no permit shall be given to any concern to sell milk in the city unless the right to inspect the dairies of the concern is conceded as a condition. If at any time the dairies are found not to meet the requirements of cleanliness made by the Board of Health the permit to sell milk in the city shall, according to the plan suggested, be revoked at the discretion of the Board. Local inspection is at present fairly well systematized, each milk store being listed and the city divided into districts, so that the inspectors can keep close watch upon the retailers. Many arrests in all parts of the city show that adulterated milk is being sold without regard to locality. Raids have been made on some of the largest retail stores and depots and samples of milk taken which failed to pass satisfactorily through rigid chemical tests. Retailers who supply some of the largest hotels and restaurants have been found to have in their possession milk as far from pure as some of the samples taken from dealers in the east side tenement house districts. Manhattan has been divided into eight districts for inspection. There are three districts on the west side and five on the east side. There are 5,137 milk stores in Manhattan, and the inspectors from the Health Department make the rounds of them by districts from day to day. The large number of arrests recently after adulterated milk had been found in possession of the retailers, has caused the retailers to be more exacting with the wholesale dealers, and so far as this affects the quality of the general supply the results have been gratifying. It is almost invariably asserted by the accused retail dealer that the milk was adulterated before it was sold to him. A great advance will have been made if inspection of the dairies be made a routine procedure.

PHILADELPHIA.

The Pathological Society of Philadelphia.—Dr. Victor C. Vaughan, of the University of Michigan, will address the Philadelphia Pathological Society on December 8, at the College of Physicians, on the relation of Food Adulteration to the Public Health. A reception will be tendered to Dr. Vaughan immediately after the meeting.

Exhibit of White Haven Sanatorium.—Donation day for the White Haven Sanatorium was held during the past week at 1604 Chestnut Street, where an exhibition was given of the work of the institution. Model rooms for consumptives and tents for outdoor treatment were shown. Lectures by members of the Phipps Institute were given daily.

German Hospital.—Donation day at the German Hospital on Thanksgiving day was so well attended that over \$12,500 were received, including \$5,000 for a free bed. Improvements made during the past year include a four-story building containing a nurses' dormitory and diet kitchen at a cost of \$30,000.

Infirmary and Laboratory at the Zoo.—A fully equipped infirmary and pathological laboratory has been established at the Philadelphia Zoological Garden. It will be used for the study and treatment of the diseases of animals and also for the study of comparative pathology. Dr. Charles B. Penrose is to be director of the laboratory and Dr. C. Y. White assistant director.

Mutter Lecture.—The Mutter lecture on Surgical Pathology was delivered at the College of Physicians, Friday, December 2, 1904, by Dr. G. H. Monks, Lecturer on Surgery in the Harvard Medical School. His subject was "Studies in the Surgical Anatomy of the Small Intestine and its Mesentery."

The Samuel D. Gross Prize.—This prize of \$1,200 will be awarded on January 1, 1905. The conditions annexed by the testator are that the prize "Shall be awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty printed pages, octavo, in length, illustrative of some subject in Surgical Pathology or Surgical Practice, founded upon original investigations, the candidates for the prize to be American citizens." It is expressly stipulated that the competitor who receives the prize shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery, and that on the title page it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery. The essays, which must be written by a single author in the English language, should be sent to the "Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College of Physicians, 219 South Thirteenth Street, Philadelphia," on or before January 1, 1905. Each essay must be distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, and containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay. The Committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year. The Committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

CHICAGO.

Resolution Placing Cook County Hospital Staff Under Civil Service Rescinded by County Board.—At a meeting of the Cook County Board, held November 25, the resolution offered at a previous meeting placing the medical staff of the County Hospital under the merit law was rescinded. The President of the Board, Mr. Foreman, promptly vetoed this resolution, and the Board decided to absolutely ignore him by ordering the disapproval placed on file. This confused state of affairs was the culmination of a meeting of the Public Service Committee, composed of all the members of the Board, which lasted all day, and at which physicians, both the opponents and the upholders of the civil service examination, were present and said what they had to say. It would seem from the remarks that were made that those opposing the application of the merit law to the County Hospital medical staff manifested jealousy of what they termed the domination of the medical branch of the University of Chicago (Rush Medical College) in the conduct of the hospital affairs. Dr. C. E. Humiston said "It is Standard Oil against Castor Oil." Dr. William E. Quine, Dean of the College of Physicians and Surgeons, the Medical Department of the University of Illinois, expressed his grievance against the way things were conducted at the hospital. In the last examination for internes, candidates from one institution triumphed when they appeared before examining boards from their own college, but showed only

ordinary ability when examined by members of other schools. He said, "The men who brought that condition to pass are now trying to pack an examining board in favor of one institution. I am opposed to that conception of reform." The President of the County Board was drawn into the discussion by Dr. Thomas A. Davis, who accused him of acting as dictator in the hospital affairs. He said there were at least six men in the room who heard the President of the Board insist on Dr. Billings' election to the position of President of the hospital staff. These adverse declarations were not allowed to pass without reply from the upholders of the merit law. Dr. Hugh T. Patrick defended the proposed examination, when a commissioner of the board interrupted him to ask his opinion about the opposition of so many physicians to the civil service examination. Dr. Patrick replied that "I cannot tell you all that I think about those doctors without being discourteous toward some of the estimable members of the profession."

Charge of Favoritism Answered.—The charge that favoritism would be shown toward men connected with Rush College by the examining board, as at present constituted, was answered by Dr. Frank Billings. Without descending to personalities, Dr. Billings made the following declaration: "In the constitution of the examining committees of the board on the main subjects, which are surgery, medicine, nervous diseases, children's diseases, and obstetrics, Rush College has a minority rather than a majority. In the committee on surgery there are five men, one from Rush, one from Northwestern, and one from the Physicians and Surgeons. The other two are outsiders, not connected with any college, but it so happens that all five are graduates of Rush. In the department of medicine the three examiners are Dr. Quine, Dr. Frank S. Johnson and Dr. Otto Schmidt. Rush has no representation on this committee. Northwestern and Physicians and Surgeons have one each, the other is unattached. Of the two men on the nervous disease committee, neither is a Rush college man, and the three obstetricians are divided between the three big colleges. The same is true of the committee on children's diseases and the committee on skin diseases. In pathology one is from Rush, one from Northwestern and one unattached. One man charged that out of forty-eight physicians and surgeons on the examining board thirty-eight were from Rush College. This statement was promptly corrected by Commissioner Walker. He declared that there were thirty men on the board, divided as follows: Seven Rush, seven Northwestern, five Physicians and Surgeons, two eclectics, two homeopaths, two dentists and five at large. The Public Service Committee, by a vote of 9 to 4, recommended that the county board rescind its action. This resolution was adopted despite the fact that the matter is before Judge Tuley on a petition for an injunction restraining the civil service commission from holding the examination. The board formally then accepted the recommendation.

Chicago Orthopedic Society.—At a meeting of this society, held November 22, the following officers were elected: President, Dr. John Ridlon; Vice-President, Dr. John Lincoln Porter; Secretary and Treasurer, Dr. Arthur B. Hosmer.

McCormick Memorial Institute for Infectious Diseases Receives a Donation of \$100,000.—Mr. Otto Young has given this amount toward the en-

dowment fund of this Institute. The philanthropic project is delayed pending proposed amendments to the hospital ordinance.

GENERAL.

Bubonic Plague Reported in Chile.—While the prevalence of bubonic plague has not been officially declared in Chile, it is stated that there are cases that the Chilean Government daily conceals in order that steamers may not omit touching at ports at which there are no sanitary regulations.

Existence of Yellow Fever Denied.—Dr. Carlos Finlay denies positively the existence of yellow fever in the island of Cuba. It was not within possibility, he said, that the half dozen Marine Hospital Inspectors stationed at Cuban ports should have discovered cases which the thoroughly organized Health Department of Cuba had failed to discover, and more than improbable that they should know of such cases and yet fail to call the attention of the Cuban department to them. Dr. Finlay said that the only yellow fever case originating in Cuba in more than three years was that of the American, Scott Fuller, at Punta de Sol, which was extremely light, and of questionable authenticity. Suspicion attached also to Fuller's attendant, but the disease had not developed. Health officers at all Cuban ports, Dr. Finlay said, treat all fever symptoms in arrivals from Caribbean and South American ports as suspicious, and also all others that are in the least questionable. Dr. Delgado, a Cuban, who is the United States Marine Hospital Inspector at Havana, disclaimed any knowledge of yellow fever cases this year, except in six persons, who arrived from Mexico, and who were immediately isolated. Of those two died and the others recovered.

Meeting of American Association for the Advancement of Science.—The University of Pennsylvania will be the scene of the greatest meeting of scientists in its history during the Christmas holidays. Arrangements have been made for forty different societies to convene here at that time, the university acting as the host to them all. The principal convention will be the fifty-fourth annual meeting of the American Association for the Advancement of Science, which will meet December 27 to 30. Ten of the forty societies mentioned above are sections of the American Association, while the other thirty are national societies, dealing with all aspects of science. The American Association will attract at least 1,500 delegates and educators. Carroll D. Wright, the Commissioner of Labor, has been selected to deliver the principal address, which will be made on December 28.

Massachusetts General Hospital.—The Zander Room at the Massachusetts General Hospital has now been open for patients since June 23, 1904, and its services are becoming more and more in demand for medical, surgical, orthopedic and nerve cases of all sorts. The old Bigelow amphitheater, left vacant by the completion of the new operating rooms two to three years ago, and since that time used only for clinics, has been entirely remodeled into a large, well-ventilated apartment, with a gallery and adjoining offices, and here are set up the 40 to 50 beautiful pieces of mechanism which go to make up the Zander apparatus. There are recording machines for lateral curvature and scoliosis of all kinds; machines for massage of every part of the body, from the little finger to the entire trunk; apparatus which can be operated by the patient—action move-

ments or by electricity—passive movements, for exercising every part, muscle or joint, of the human body, slowly or rapidly, with practically no force at all, or with a very powerful leverage. Patients come here to be treated from the hospital wards, the Out-Patient Department, and from outside physicians (in a few instances), the greater number of cases are naturally orthopedic, lateral curvature, scoliosis, weak backs, flatfoot, etc.; surgical cases, fractures, sprains in convalescent stage and arthritides of all kinds; new cases, anterior poliomyelitis and neuritis and medical cases; neurasthenics, neuroses and cardiacs recovering compensation. The entire department is under the direct supervision of Dr. Böhm, who came from Europe for this purpose. Every patient recommended for treatment is carefully examined and measured, recorded and then given a prescription, with the list of exercises or massage to be taken; the patient then, in charge of an assistant, goes through with his movements as ordered. Take a cardiac case for example: The heart, size, murmurs, etc.; lungs as to edema, and pulse as regards rapidity, volume and tension are looked over, and the patient given his list of exercises, which at first will consist of the lightest of passive movements. After the morning's work the heart, pulse, etc., are again examined, and in this way the progress of the case is gauged. Gradually the passive movements are increased and changed to active ones, more and more rigorous in character, until finally compensation completely restored, the patient is able to leave the hospital and take care of himself. The neuroses, myocarditis and fatty hearts seem to receive the most benefit from this treatment. For the most part the patients enjoy the work, and in almost every case derive great benefit from it, and their numbers are increasing daily.

Fourth Pan-American Medical Congress.—This congress will convene in Panama the first week in January next, and bids fair to be a most delightful midwinter trip. The delegates will leave this country by the Atlantic, Pacific and Gulf Coasts the last week in December. They will return by the same routes or will make round trips (see appended list of routes). The Public Health Association meeting will take place on the following week in Havana, and those desirous of attending both meetings, can arrange to do so. From Havana, the return trip can be made directly north to New York by water or via Miami or Tampa, Florida, or New Orleans. The connections and dates of sailing are now being arranged. The Panamanian Government has appropriated \$25,000 for the scientific session and the entertainment. The congress will be held from the second to the sixth of January. The afternoons will be devoted to the scientific sessions and the mornings and evenings to trips and social functions. So far as can be learned, the program in Panama will be a reception on the first day, by President Amador of the Panama Republic, and the formal opening session of the congress the same evening. On the second day an excursion to the canal in the morning, meeting of the various sections in the afternoon, and a banquet in the evening; on the third day, an excursion down the bay to Taboga Island, where a Panama breakfast will be served, scientific sessions in the afternoon and a ball in the evening. On the fourth day, an excursion to the United States Army barracks in the morning, section meetings in the afternoon and the

formal closing session in the evening. On the fifth day, in the afternoon, those of the congressists who intend going to Cuba to attend the meeting of the Public Health Association, will sail, while those who intend returning home by way of New Orleans or New York, will remain until the following Tuesday. The program of the Public Health Association will be an inviting one and of an important character. The Cuban Committees are making extensive preparations for the entertainment of the congressists. From the returns now coming in, it would seem that at least one-half of the members of the Public Health Association will make the round trip to both medical meetings. It is understood that the Pan-American congressists who do not belong to the Public Health Association will be invited by this Association to take part in their discussions as their guests, and that they will also be invited by the Cuban Entertainment Committee to participate in the festivities.

Dr. Rudolph Matas, of New Orleans, Secretary of Section of General Surgery for the United States, informs us that an arrangement with the United Fruit Company has been perfected by which a steamer of this line will leave New Orleans for Colon on Wednesday, December 28, 1904, at 10 A.M. (instead of Friday, December 30, at 11 A.M., as previously announced), which will reach Colon (Panama) on Monday, January 2, 1905, the opening day of the Congress. In view of the facilities offered to reach Panama via New Orleans it is expected that many will choose this route and those who intend to do so will please forward their names to Dr. R. Matas, Secretary of Section of General Surgery, No. 2255 St. Charles Avenue, New Orleans, La., not later than December 22, 1904.

Routes and Rates to the Fourth Pan-American Medical Congress in Panama, and the Public Health Association Meeting in Havana. (Combined Trip.)

—The routes to the Fourth Pan-American Medical Congress are gradually narrowing down as more advantageous rates are being offered. Those who go only to the Pan-American Medical Congress will probably go and return by the way of New York or New Orleans. From the former starting point \$100 will be charged for the round trip; from the latter point \$50. By far the greater number, however, will make the round trip to both of these meetings, returning to Baltimore via Jamaica on the steamer which the commission is arranging to charter. The Di Giorgio steamship line of Baltimore, Md., offers special ship for exclusive use of party, including meals and berth, at sea and in ports, to Panama, Havana and return, attending both meetings and visiting Kingston and Port Antonio, Jamaica, for \$130, providing fifty persons take passage. The Athos will leave Baltimore, December 27, 11 A.M., arriving in Panama January 2, P.M., or 3, A.M. Leave Panama January 7, A.M., arrive in Havana January 9, A.M. Leave Havana for Jamaica January 16, A.M., arriving at Baltimore January 18. The Athos is one of the staunchest of steel ships, with electric lights, running water, and all modern equipments in the way of toilet conveniences. She has a fine deck surface and a number of deck staterooms, and is guaranteed to be in first-class condition. The president of the Steamship Company will be one of the party on the trip. The members of the party can live on board when in ports if they desire, thus saving hotel expenses. Lunch and dinner will probably be served on deck when in smooth water.

Physicians can bring members of their families and friends at the same rates. All arrangements must be closed ten days before sailing date. Number of passengers limited to seventy. Application for reservation of staterooms, berths, etc., to be addressed to Ralph F. Nalley, 105 Park Avenue, Baltimore, Md.

Tuberculosis Investigation.—The imperial commission, appointed by the Government to investigate the relations between bovine and human tuberculosis, met November 26. According to the *Sum*, Dr. Weber reported that the investigations hitherto made showed that bovine and human bacilli were absolutely distinct biologically and one never develops or changes into the other. An examination of fifty-six bodies of persons who died of tuberculosis showed the presence of human bacilli only in fifty. There were bovine bacilli, however, in six, three of whom were young children. The surmise is permissible that the latter received the bacillus from the milk of a diseased cow. Two other cases, which Professor Weber regards as most important, were where corpses showed bovine bacilli in the glands and human bacilli also in other portions of the body. They were distinct cases of double infection. Another important case was that of lung tuberculosis where bovine and human bacilli were associated. The commission is reported to have reached the general conclusion that tuberculosis in human beings was caused by the human bacillus, but urges the careful use of all prescribed measures to prevent infection with the bovine bacillus.

The American Journal of Anatomy.—This journal was founded in 1901 for the purpose of collecting and publishing in a worthy manner contributions to the science of Anatomy emanating from American investigators. Since the inauguration of this journal, there have appeared two volumes containing about 500 pages each, with many text-figures and monochrome and colored plates. The titles of papers, including those in Volume III, are announced in this circular. The wealth of material at the disposal of the editorial board has insured prompt publication, and has made it possible to maintain a creditable standard. The presentation of the subject of anatomy has been representative of its various phases, including not only contributions on Human Anatomy, but also on Comparative Anatomy, Embryology, Histology, Neurology and Cytology, branches of the science of Anatomy which are so intimately bound up with the problems of Human Anatomy that they have been included within the scope of this journal. It was hoped by the founders of the journal that it would not only serve as a medium of publication for a worthy type of anatomical research, but would also tend to create a higher standard in anatomical work and attainment, and thus also advance the cause of modern scientific medicine. That his hope has already been realized in a measure seems reasonably assured. According to an arrangement made with the Association of American Anatomists, the *American Journal of Anatomy* has become the medium for the publication of the proceedings of this Association, together with abstracts of the communications presented at its annual meetings. The board of editors, realizing that the founding of a scientific journal could not be undertaken without some financial guarantee to defray the deficit which would, in all probability, be incurred for a number of years, have, in conjunction with a number of generous persons, subscribed to a reserve fund to insure a beginning.

The regular annual subscriptions, together with this reserve fund, which is, however, available for only a limited period while the journal is becoming established, have enabled the board of editors to maintain the *American Journal of Anatomy* in its present form. It will be readily agreed, however, that the success of the journal can be permanently assured only by the continued support of its regular subscribers, and by further efforts of those who are interested in its welfare. The board of editors feel warranted, from the encouragement and support which they have thus far received, in expecting further additions to the subscription list from institutions and individuals who profit by the enterprise of the journal.

OBITUARY.

DR. HENRY M. LYMAN, formerly connected with Rush Medical College, died in Chicago, November 21, after an invalidism of four years. The cause of death was angina pectoris. He was born in Hilo, Hawaiian Islands, November 26, 1835, and was graduated from Williams College, Massachusetts, in 1858, as valedictorian of his class. He began the study of medicine at Harvard Medical College, but graduated from the College of Physicians and Surgeons of the City of New York in 1861. After a short term as interne in a medical hospital, he entered the army and served as acting assistant surgeon from 1862 to 1863, being on duty in the military hospitals of Nashville, Tenn. In 1863 he established himself in practice in Chicago, paying special attention to diseases of the nervous system. From 1871 to 1876 he was professor of chemistry in Rush Medical College; from 1876 to 1877, professor of diseases of the nervous system; from 1877 to 1879, professor of physiology and of nervous diseases, and from 1889, professor and emeritus professor of the theory and practice of medicine in the same institution. He was also professor of medicine in the Northwestern University Woman's Medical School from 1880 to 1888. He was the author of a textbook on the "Theory and Practice of Medicine," which was published in 1892, and of numerous articles in the literature.

DR. NELSON L. NORTH, of Brooklyn, was stricken with a hemorrhage of the lungs at Gates Avenue and Broadway last week, and died shortly afterward. He was born at Elba, N. Y., in 1830, and studied medicine in the College of Physicians and Surgeons. He was the author of several medical works and belonged to the American Medical Association, the New York Academy of Medicine, and the Kings County Medical Society.

DR. W. L. COLEMAN is dead at his residence in Austin, Texas, aged seventy-one years. He was an authority on yellow fever, having served through several epidemics and won a Howard medal, given in appreciation of his services in fighting this disease. During the Spanish-American war, Dr. Coleman was sent by the United States Government to make an examination of the yellow fever condition of Cuba. He was the author of a book on the disease.

Peculiar Electrical Accident.—According to the lay press a user of the telephone while talking pressed an electric button, and in some manner established a circuit and was rendered insensible from a resulting shock. The cause of the accident could not be ascertained.

CORRESPONDENCE.

THAT OPTOMETRY BILL AGAIN!

To the Medical Profession of the State of New York:

DURING the legislative session of 1904, a society of opticians known as The Optical Society of the State of New York, petitioned the legislature to enact a law creating a State board of examiners in optometry. Before this board would appear all persons who desired to practise optometry, which practice was defined in the act to be enacted as "the employment of any means other than the use of drugs for the measurement of the powers of vision and the adaptation of lenses for the aid thereof." The Medical Society of the State of New York opposed this bill, and with the aid of other organizations, especially the County Medical Societies and the Optical League (an organization of opticians doing a legitimate business), secured its defeat.

Since the last election, this optical society has been forwarding to physicians in all parts of the State, as well as to the members-elect of the next legislature, a document giving reasons why a law of this kind should be enacted and asking their endorsement.

At the time of the hearing on the Optometry Bill before the legislative committees of last year, the opticians presented a long list of names of physicians who had endorsed their efforts. The undersigned communicated with every name on that list, and learned that where reputable physicians had endorsed the measure it was through a misapprehension of the real purpose of the bill, and when its true character was pointed out to them, they not only withdrew their endorsements but in many cases wrote vigorous letters in opposition to it. Many of the names were fictitious, the communications addressed to the addresses given being returned as not found. A large number were the names of irregular practitioners, as osteopaths, spiritualists and so on. There is no doubt that the object of the opticians in presenting the present arguments is to obtain the endorsement of physicians so that at the next legislative session these signatures can be used to offset the opposition which will be presented by the regularly organized medical bodies of the State. I therefore address the profession of the State, urging its members not only to refuse to endorse this and similar measures but to make an effort to present to their representatives, both in the Assembly and the Senate, the true merits of the case, and urge their opposition to it.

The arguments presented by the opticians are very misleading. Their claim, of course, is that they desire to protect the community from incompetent people, but the fact is (as every well-informed physician must know) that they are all incompetent. They seek to create a separate profession. This they deny, but in their remarks before the legislative committees they continually used the expression "our profession." They seek the legal right not only to apply lenses for the correction of defective vision which may or may not be due to errors of refraction, but they also seek to treat headaches, dizziness and the various reflex phenomena which may be due to affections of the eye itself or to affections of organs remote from the eye. They pose as being competent to make a differential diagnosis. To prepare physicians to do this work the law requires that a four-years' course in a medical college shall be taken, after which a medical examination conducted by the State must be passed. Physicians themselves find that after this preparation it is often difficult to be sure of one's ground; and, if this is so, there seems to be no good reason why opticians should be allowed to undertake the same work with any less preparation.

It seems unnecessary at this time to go into an extended argument in opposition to this bill. The effort to secure its enactment is not an honest one. Opticians know that they are violating the law in following the occupation which they are now engaged in, and they say that if their bill is enacted it will not give them any more powers than they now possess, while the fact is that the enactment of the bill will give them the legal right to do what they are now doing in violation of the law. They really desire to use the legislature as a tool to put them beyond the grasp of the law; and if this is once clearly brought to the attention of our senators and assemblymen, there is no doubt what the outcome will be. We have met this and similar efforts more than once in the past and there is no doubt that we shall meet many more in years to come; but from our experience we feel justified in making the assertion that if the medical profession will present a united opposition to measures of this kind, they will never be enacted into law in the State of New York.

FRANK VAN FLEET, M.D.,

Chairman of the Committee on Legislation of the Medical Society of the State of New York.

NEW YORK, November 23, 1904.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, held November 17, 1904.

The President, A. H. Smith, M.D., in the Chair.

The scientific business of the evening was under the auspices of the Section on Medicine and the first part of the program consisted of a demonstration of the Hoy Opaque Projector by Dr. H. Holbrook Curtis.

Stereoscopic Reflection.—The Hoy Opaque Projector enables the lecturer to demonstrate opaque objects on the screen, as does the stereoscope for transparent. The human hand, for instance, can be held at the focus of the lens and the representation of it made to appear on the screen. Any microscopical specimen may be demonstrated to a class in the same way. Pictures and illustrations of various kinds in books, even those that are delicately colored may be enlarged and reproduced exactly as they are.

Dr. Piffard, in discussing the Projector, said that some thirty years ago an instrument similar to this had been used by Professor Arnold. Owing to the fact, however, that a close examination always gave more information than such a demonstration, it proved not to be so useful as was anticipated.

Preservatives in Foods.—H. W. Wiley, Chief of the Bureau for Chemistry of the United States Department of Agriculture, then gave a preliminary report of the results of the investigation that has been made during the past year, with regard to the influence of preservatives and adulterants in food on the public health by the United States Department of Agriculture.

Dr. Wiley said (author's abstract):—"The point of view of the physician in respect of the use of preservatives in foods is somewhat different from that of the manufacturer or even of the general consumer. The term 'preservatives in foods' may justly include also coloring matters and certain edulcorants, such as saccharin and its compounds. The point of view of the manufacturer of food products relates to the preserving of the products in such a manner as to present them to the consumer in a practically fresh state. The view of the general consumer relates to the consumption of foods which are pre-

served in the manner indicated by the constituency which is in ordinary good health. The point of view of the physician includes also and particularly the effects of foods of this kind upon invalids and convalescents. It cannot be denied that good food is the principal weapon in the armament of the physician. As long as his patient can digest and assimilate a wholesome diet there is always hope of recovery. The very moment the digestive organs, however, cease to act, when the food which is given is no longer digested or assimilated, there is every reason to fear the gravest danger. Food, therefore, in this sense, is the most important element of the *materia medica*.

"In order that there may be no unnecessary discussion of certain points in connection with this investigation, I may state, without hesitation, that probably the great majority of healthy and vigorous people can consume a certain amount of food preservatives without any apparent ill effects. In the researches which we have conducted at Washington this has been illustrated time and time again. This, however, is not the important point of the investigation. It is not the purpose of an investigation of this kind to prove that every person who consumes preserved foods is subject to injury. The case is clearly made out, if those who are weakest and least able to withstand any unusual disturbance of the metabolic process suffer injury. Foods, in other words, are prepared for the whole people, the strong and the weak, and they should be so safeguarded that no added substance should be permitted which could work an injury on the least resistant.

"Nor do I think it is a sufficient answer to this statement to say that there are many conditions in which pure food itself, of an excellent quality, produces injurious effects. This, of course, can not be denied. Every physician meets in his daily practice many cases of this kind. The fact that foods of undoubted purity may themselves work injury is no argument in favor of admitting to these foods foreign and unnecessary substances which are in themselves injurious or become so when mixed with foods. For instance, we have shown in late researches in the Bureau of Chemistry, that cranberries contain large quantities of benzoic acid, in some cases amounting to the ordinary quantities of this substance used as a food preservative. The natural occurrence of benzoic acid in cranberries does not warrant its addition to those foods which do not contain it, nor does it warrant the addition of benzoic acid in cranberries themselves. Cassava, which is a common food product in the tropics and as far north as South Georgia, contains considerable quantities in its natural state of hydrocyanic acid. So great is the quantity of this poisonous substance in some of the varieties grown in the tropics that it is never eaten until it has been boiled for the purpose of drying off this poisonous substance. The occurrence of this poisonous matter in a natural food cannot be cited as a justification for adding hydrocyanic acid to foods in general. As is well known this same substance exists in peaches and apricots, especially in the pit, although in much smaller quantities than in the cassava. Nor can we admit, it seems to me, the arguments *de minimis*. The advocates of the use of antiseptics in foods, I believe, admit, without exception, that all of them in large quantities are injurious. They also cite what is perfectly true, that common salt in large quantities is injurious, and therefore they draw the conclusion that as common salt, which is an antiseptic,

is not injurious in small quantities, and is injurious in large quantities; therefore, any other antiseptic, for instance, salicylic acid, may be judged of the same way. But this is not the case, as will be seen by a closer analysis of this argument. Common salt is a necessary constituent of human foods. It is acknowledged by physiological chemists to be the source of hydrochloric acid which is so necessary in stomach digestion. Hence, not only is it an antiseptic but it is much more a condiment and a necessary constituent of food. In fact, nearly all the condimental substances in common use, with the possible exception of the peppers and spices, are at the same time condimental and have, to a certain extent, a food value. This is especially true of salt and sugar. It probably is not true of vinegar, which is solely condimental and antiseptic, but is not of any appreciable value as a food. Alcohol is also condimental and preservative and has a distinct food value. The physician thus makes a broad distinction between antiseptics which are condimental and to a certain extent nutritive, and antiseptics which are non-condimental and non-nutritive. There can be no objection, therefore, to the proper use of common salt, of sugar, of vinegar, and of wood smoke in the preservation of foods. These bodies all reveal themselves by their taste or odor and thus a natural limit is set which prevents their excessive use. On the contrary, the other line of antiseptics and preservatives which are non-condimental, such as are represented by salicylic and benzoic acids and boric acid, practically have no taste or odor in the quantities in which they are employed, and hence the consumer is not notified by any natural property of these bodies of their presence. It appears, therefore, that here can be no justification from a dietary point of view in the addition of even small quantities of non-condimental antiseptics to foods. It might be granted, for the sake of argument, that if there were only one antiseptic known, its use in small quantities might be in certain cases allowed. For instance, in the case of salicylic acid, which many healthy persons can consume, even in considerable quantities, without any very great discomfort; if this were the only antiseptic used the *argumentum de minimis* might be allowed to stand. But when we consider that there are a half dozen, or perhaps more, non-condimental antiseptics in common use, all of which might be consumed in a single meal under certain circumstances, it is evident that the *argumentum de minimis* fails to apply, for if the consumer should eat six small quantities it would be equivalent to eating one large quantity.

"Again we find the argument used in favor of antiseptics of a mineral character, like boric acid and borax, sulphites, etc., to the effect that the presence of mineral salts is absolutely necessary to physiological processes. We all admit, I think, without doubt, that the metabolic functions depend entirely for their action on the laws of physical chemistry. Osmotic pressure, solution, translation through membranes, diffusion, etc., are the physical forces which develop the phenomena of living beings. But in this case it is not evident that any unusual and unknown substances are employed. We have, in common salt and the mineral salts which exist in ordinary foods, in the carbonates and the bi-carbonates which are probably formed during the metabolic processes, an entirely sufficient amount of mineral matter to secure the proper activity of all the organs. There seems to be, therefore, no justification for the

addition of other substances of a mineral nature to aid a process already sufficiently well secured.

"In the investigations which were made in the laboratory at Washington with boric acid and borax, distinct disturbances of the metabolic functions were disclosed. They were not of a great magnitude and might easily escape the ordinary observations. They were revealed, however, by the chemical balance in a most unmistakable manner. Even when a small quantity of boric acid was administered daily, not to exceed a half a gram over a period of fifty days, there was noticed a gradual loss of weight, a slight loss of appetite, occasionally a tendency to a feeling of fullness in the stomach and especially in the head, developing at times into a dull headache, a marked but not very distinct indisposition or inability to perform the ordinary mental exercise which the young men engaged in during their daily work, a disturbance in the phosphoric acid and nitrogen balances, an increase in traces of albumen which exists in certain cases in the urine, and other evidences of change which showed an effect which could not be regarded as otherwise than deleterious.

"On the other hand, when the preservative was given in rapidly increasing doses over periods of twenty days, beginning with half a gram and rising to as much as three or four grams a day, not only were the disturbances which relate to the changes in the balances, as indicated by the chemical analysis observed, but also marked symptoms of *malaise* and discomfort, loss of appetite, rapid loss of weight, occasional nausea, fullness in the head, bleary eyes, dull and persistent headache, inability to perform the ordinary mental duties, etc.

"Both of these sets of experiments lead to the same conclusion, namely, that while most healthy young men can take a considerable quantity of borax for a short period without any apparent discomfort, when continued for a long time or when rapidly increased in amount, distinct disturbances of metabolic activity take place. Marked symptoms of discomfort, though not amounting to real illness, are observed.

"Another point that must be considered is the fate of the added preservative in the organism. This we have studied very carefully both with borax and with boric acid, as well as with salicylic, benzoic and sulphurous acids. Only the data of the first two, however, are complete. The work shows that in round numbers 80 per cent. of the total quantity of boric acid and borax administered is excreted by the kidneys. Nearly all the rest of it is excreted through the skin. These data show very clearly where the burden of excretion lies. Furthermore, it was shown conclusively that neither boric acid nor borax undergoes any marked change in the body. Boric acid remains practically boric acid and the borax remains borax. It might be assumed with a good deal of probability that the boric acid would be neutralized to a certain extent by the alkaline bodies with which it comes in contact, especially in the small intestine and in the blood. On the other hand it might be reasonably inferred that borax would undergo more or less decomposition in the presence of the acids in the stomach. Doubtless both of these assumptions may be partly true, as it is rather difficult to affirm that there is no change at all in these bodies. It may be that a little of the boric acid is neutralized, forming a borate or bi-borate, and a little of the borax decomposes, forming free boric acid and a sodium salt, probably chloride or lactate. There is one point of judgment, however,

which shows that little change takes place, namely, the effect of these reagents upon the acidity of the urine. During the administration of boric acid the acid in the urine was markedly increased while during the administration of the borax it was markedly diminished and in some instances an alkaline reaction set up.

"Aside from the points which are here presented, another phase of the subject must be considered, namely, the additional burden which is placed upon the kidneys. Of course, it may be said, as it doubtless will be, that the amount of this burden is very slight, but, as a rule, a great burden which produces a breaking strain is made up of increments of very small particles. I think it must be admitted without question that the kidney is a well worked organ ordinarily and has about all that it ought to be called upon to do. If you add to foods a half dozen different substances all of which are practically eliminated by the kidney you increase its burden to that amount. This increased burden does not seem to be justified by the good, if any, which is gained. It will not be denied by any one that practically every one of the substances used as antiseptics in foods may be, in itself, a very useful remedy in certain diseases. We know that borax and boric acid are largely used for remedial purposes and the same is true of salicylic acid, of benzoic acid and of formaldehyde. This, it does not seem to me, is a justification for the use of these bodies upon those who are perfectly healthy. In other words, drugs are not indicated except in cases of disease and where they are used for prophylaxis.

"Summing the matter up in the light of the experiments which we have conducted and of those which have been conducted by others, we admit first of all that there are many contradictory data which are difficult to reconcile. For this reason it seems rather precarious to base a definite conclusion upon experiments with one or two persons. The number in our experiments was twelve, and had there been facilities for caring for them it would have been better if the number could have been larger. It is only when we consider the data for all twelve as a whole that definite and reliable conclusions can be drawn. It must be admitted further that the mental state must be reckoned with in all experiments of this kind. But whatever particular mental irritation or excitement is produced, repetition and time will tend to diminish and even neutralize it. For a few days it is more than probable that the mental attitude will have a considerable effect, but when a young man sits down for an eight or nine months campaign of this kind he soon falls into a state where it is believed the mental attitude does not produce a very great effect. It might have been possible to control this to a certain extent by running a number of blanks, that is, having those upon the table who supposed they were getting preservatives and yet were really not. The limited number of subjects which we had at our disposal, however, seemed to indicate that this method of control would not be as valuable as to use them all for a direct experiment.

"Finally it may be said as a result of our experimental work, that there is every indication to lead us to believe that the use of boric acid and borax should not be forced upon any one. In those cases where it may be good it can be specially provided. They certainly should not be used with infants, invalids, convalescents, or those who suffer from any particular digestive idiosyncrasy. It should not, I believe, be put in foods of any kind except when they are plainly marked, and even not then except in special cases and for special purposes. What is true of boric acid and borax will probably be found

equally true though perhaps not to the same degree of all the other common antiseptics in use."

The discussion was opened by Dr. G. L. Peabody who said that in the section on legal medicine at Paris in 1900, Dr. Brouardel had declared that the amount of preservatives now being employed in food, was, to say the least, disquieting. Unfortunately the present methods of legal procedure are not such as to limit what evil there may be in the matter. The question usually put by the Court is, Would the amount of preservative known to be present in a given sample, prove fatal? Of course this question must be answered in the negative. In the same way, the administration of any poison might be proved harmless. If one one hundredth of a grain of morphine is recovered from the organs of a patient, this demonstrates the presence of the poison, but cannot be said to show that a sufficient amount was taken to produce death. In spite of all the symptoms of opium poisoning then, the legal decision may be in favor of a criminal. Dr. Peabody said that when a small amount of a substance was frequently repeated, it may have more injurious influence than if an equal amount were administered all at once. It was the teaching some years ago that a good sized dose of calomel, 10 to 20 grains, repeated once if necessary, given just after the initial chill of pneumonia and before the stage of consolidation could be demonstrated, might abort the pneumonia. In not a few instances, Dr. Peabody himself has given 20 grains and repeated the dose within twelve hours. All that resulted was a smart purgation without any serious poisoning affect. If, however, calomel were given in divided doses of say one-tenth or one-twentieth of a grain every hour until 20 grains were taken, salivation and other toxic symptoms would be so severe as probably to prove fatal. Dr. Peabody pointed out that the utility of foods depends mainly upon their instability, that is on their tendency to change easily and so be assimilated. What ever hinders this tendency for food materials to change, impairs digestion. Hence the danger of food preservatives. This danger is all the greater because preservatives are more apt to be used in the food of the lower classes, who need all the nutrition they can obtain from their food and who are deprived of part of its beneficial influence by the slowness with which the gastric juice will act upon it. It is not as yet known how many anemias may be due to the fact that insufficient nutritive material is absorbed from the digestive tract to keep up blood equilibrium. In France there has been much discussion with regard to what is called plastered wine. A certain amount of sulphate of potash and plaster-of-Paris is added to wine in order to give it a dry flavor. Many good authorities consider that these materials are prone to produce a distinct tendency to cirrhosis of the liver. In at least one case, that has been under Dr. Peabody's observation, bottled beer, which had been prepared in some special way, proved a source of annoying digestive symptoms to a physician who had tried the experiment over and over again of using it after a quitting of it for a time and had always had a return of his symptoms.

Old Persons.—The danger of substances accumulating in the system is especially great in old persons. Brouardel showed by experimentation that at the age of twenty-five years, if a gram of salicylic acid were taken, its elimination began one hour after ingestion and was practically complete after twenty-four hours. At the age of forty-four years, however, it was several hours before elimination began, and it was at least two days before the last of the acid had disappeared. At the age of sixty-five years, elimination did not begin

until the second day and took many days to complete. Therefore it is dangerous to have any substance frequently given to old persons if there is any tendency for it to accumulate. Certainly boric acid and borax cannot be considered entirely harmless. A five per cent. solution in the pleura and in the case of a lumbar abscess has been known to prove fatal. Even less than this has given rise to very serious symptoms in cases of dilated stomach when boric acid solution was used for washing out the stomach once or oftener each day for a prolonged period.

Boric Acid in Therapeutics.—Some years ago boric acid obtained a reputation as a remedial agent in epilepsy. As a consequence, it was used, either in combination with the bromides or by itself, in considerable daily doses for long periods. It was then proved to be a distinctly dangerous drug. It seemed to be especially irritant to the kidneys, and patients suffering from any kidney disturbances at the beginning of the treatment soon proved intolerant to its prolonged employment. Even in patients, however, and except for their epilepsy, who seemed to be perfectly healthy at the beginning of the boric acid treatment, symptoms of uremia sometimes developed. The mere stoppage of the administration of the drug did not always prove sufficient to put an end to these unpleasant complications. Fatal uremia, even was not unknown. It is very evident that the experience of physicians all over the world is entirely opposed to the thought that boric acid, even in doses usually not considered large, can be considered harmless, if it is taken for a long time. This of itself would seem to be enough as regards the use of the substance as a preservative for food materials.

Difficulties of Investigation.—Dr. Darlington, Commissioner of Health of New York City, said that many complaints are received with regard to supposed adulterated food, but that it is extremely difficult to secure evidence of the presence of enough poisonous material for purposes of prosecution. Besides, the department is not ready for extensive investigation in this line. Often it is found that in cases of supposed poisoning of food, patients have really died from some disease. This is not infrequently the case with regard to terminal kidney disease or with regard to such affections as cerebrospinal meningitis. Of course, under conditions, such as have recently been exploited, in which wood alcohol is added to whiskey, serious results lead to the detection of the poison. It seems clear, however, that wherever any chemical preservative is added to food, this fact should be stated plainly on the label. With regard to milk, however, it seems utterly inadvisable that any preservative should be allowed. No antiseptic can make up for proper cleanliness of milk. New York draws her milk supply from a distance of four hundred miles in some cases, but the only preservative needed is ice. The local government board in London allows the addition of borax to cream and butter, but this seems only to leave a path open for the use of preservatives and other material.

Milk Preservation.—Dr. Rowland Freeman said that for a time it was thought that preservatives might be permitted in milk. Whenever this substance is properly handled, however, that is put on ice, shortly after it is obtained, there is no need of any chemical preservative. As a matter of fact, permission to use it will surely result in serious inconvenience to the children of large cities.

Increase of Gastric Disorders.—Dr. E. E. Smith said that it seems not unlikely that the increase of gastric disorders, which has been noted in recent years, may be due to the fact that preservatives have been

used more than was suspected. This is especially true for the increase of acidity which has become so common a complaint, especially in the case of neurotic individuals. It seems not unlikely that the effort of the stomach to overcome the alkaline food preservatives leads by reaction to an increase of the gastric acidity beyond what is necessary. In experiments with borax upon animals, Dr. Smith found that a special tendency to the production of irregular tufted patches of hair was produced, so much so that the borax animals could be picked out at once. As the borax is excreted through the skin, it seems not unlikely that it is the irritation of its presence near the hair follicles that causes this result.

Experts Differ.—Dr. Piffard said that in a case in which he was asked to give expert testimony before a legislative committee, he found that a distinguished professor of physiology told the senatorial committee that borax was absolutely harmless in food. Notwithstanding this, the law was passed forbidding its use. Since then judges have thrown cases of conviction out of court because they insist that there is no evidence of the poisonous effect of such substances. It seems clear that there is much more danger in whiskies than has been thought. Wood alcohol is present much oftener than might be imagined. The especial flavor of Scotch whisky, which is now so popular, is said to owe its flavor to amyl alcohol. The German spirits, made so extensively from potatoes, differ entirely from grain spirits and are likely to prove more harmful.

Formalin in Milk.—Dr. Jacobi said that Von Behring now announces that all tuberculosis in children is due to the use of milk containing infectious material. He proposes to treat all milk with formalin, which will kill these germs and eradicate tuberculosis. He seems to consider formalin harmless. Another German observer, however, has shown that the lab ferment, that is the active agent in the digestion of milk, becomes absolutely useless in the presence of even a small amount of formalin. Hence, if formalin is to be employed very generally, children may be protected from tuberculosis, but they will develop nutritional affections likely to prove much more serious. The use of formalin as a food preservative is now known to have produced an epidemic of dermatitis, two cases of which proved fatal in the English army. Its origin was unknown at first, but on its recurrence, it was traced to the milk supply, one part of which contained formalin and the consumers of which suffered while those fed from the other milk did not suffer. Prof. Gerhardt used to advise small doses of boric acid several times a day as a remedy for adiposity. He was an excellent observer and a conservative physician and it was on the strength of the results obtained, that he continued to use it for many years. Dr. Jacobi himself has employed it for this same purpose with excellent results. It seems to prevent an accumulation of fats and to cause fatty material to be eliminated that would otherwise be stored up in the system. He has never found it advisable to give more than two grams a day and usually one gram has sufficed. It is evident that the constant use of this material by persons who, instead of wanting to lose, wish to gain weight, would be eminently inadvisable. With regard to bottled beer, Dr. Jacobi has known one case in which some fluorine was present. It did not occur in draft beer of the same kind. This brand of beer is still manufactured and does not seem to have been improved any in this respect.

What Preservatives?—Dr. Andrew H. Smith said that it is very hard to draw the line as to what is and what is not a proper preservative. Salt has been used so long that there is now no objection to its employ-

ment. Saltpeter is mixed with all brines and yet though we know it to be a virulent poison, no serious objection to its use has ever been known. Instead of having vaguely poisonous affects, this depresses the heart and irritates the kidneys very definitely. Nearly the same thing may be said of the preservative element in wood smoke, that is creosote. As a matter of fact few people use enough of such preserved food to notice any serious affects. Elimination prevents accumulation and so saves the individual. Silver salts may produce argyria, yet the occasional use of half a grain of nitrate of silver is an excellent therapeutic measure in certain cases of indigestion. It would be necessary therefore to be sure of definite knowledge with regard to harmfulness before suggesting legal regulations in the matter.

Dangers of Preserved Food.—Dr. Smith said that it must not be forgotten that for certain varieties of preserved food there is constantly some danger of ptomain poison. In such cases the use of a mild antiseptic may prove of great service without doing any harm. After a recent gastronomical experience, in which he indulged in some *pâté de foies gras*, he experienced all the bother that might result from ptomain poison. No amount of persuasion could convince him that it would not have been better for him to have had a few grains of borax or boric acid with the preserved meat, even though it might involve some little delay of digestion or some slight irritation of the kidney, provided it would ward off the serious and painful symptoms. Therefore, it seems better that the chances of possible injury should be weighed against present customs in the manner of eating and a truly conservative course followed. With regard to cold as a preservative, Dr. Smith acknowledged that ice was indeed a very valuable preservative, but that it must not be forgotten that ice cream, as a source of poisoning, had in recent years become very familiar. It is possible for frozen material not to be aseptic and where toxins have already formed in such material, the freezing does not destroy them.

Premium on Filth.—Dr. Wiley, in closing the discussion, said that to permit preservatives to be used in milk is almost sure to put a premium on filth. The main element for the preservation of milk must be thorough cleanliness and then a degree of cold that keeps whatever bacteria that may be present from growing rapidly. In this matter it must not be forgotten that while the presence of such preservatives prevent the growth of bacteria, they do not neutralize the ptomains already present and that therefore much of the danger of the infected material in them as well as those from the presence of the preservative itself. With regard to *pâté de foies gras*, Dr. Wiley begged to say that the specimens so far examined in recent years by the government laboratories failed to disclose liver as a constituent of this material, which is so much in favor with the gourmet, but always showed veal present in large abundance. It is to veal in poor condition and not to any supposed tendency of the liver to disintegration that the President of the Academy may attribute his symptoms. With regard to wines, Dr. Wiley said that in order to secure a dry flavor, so much sulphate of potash and other material was employed that sometimes the wine smelt more strongly of the sulphurous fumes of the lower regions than of the bouquet from the vineyards of the hillsides of Provence or Burgundy, which it was supposed to bring with it. Notwithstanding this fact, French authorities are prone to insist on American acceptance of French wines and resented any criticism of the so-called preservatives employed for giving them a flavor which was supposed to add to their value.

THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, held October 6, 1904.

The President, R. C. Norris, M.D., in the Chair.

The Immediate Repair of the Cervix.—Paper by Dr. Barton Cooke Hirst. He states that the above title is a misnomer, as experience has demonstrated that the intermediate repair of the cervix after the fifth day gives the best result. This fact dictates the time for the repair of all the pelvic injuries, if the cervix must also be repaired. Trachelorrhaphy can be performed with perfect success and without morbidity or mortality during the puerperium. The specialist who criticizes the operation as to safety or success, either is prejudiced or incompetent. He performed the operation in more than 150 cases at the University Hospital, and practises the procedure in his private and consulting work. The question arises, how can the community at large be offered the advantages of specialistic attention for lacerations incident to childbearing. The writer's solution is for the poorer classes to be confined in well-appointed and intelligently-managed hospitals, and for the wealthier classes to be attended by their family physicians under the supervision of a specialist, who could deal with complications in labor, examine the patient during the puerperium, repairing whatever damage has been done, and make the final examination at the end of the puerperium. He considers that the plan is one that appeals to the general physician as practicable and desirable.

Dr. E. E. Montgomery, in the discussion, said he had listened with much interest and pleasure to the two papers upon the immediate closure of lacerations of the cervix and perineum. It certainly must be apparent to every one that the ideal method of procedure is the one which would restore the organs of the parturient woman to a condition similar to what they were prior to the occurrence of her labor. When one realizes the various sequelæ that are likely to result from failure to unite lacerations of the cervix or perineum this is still more evident. Subinvolution of the uterus, the increased size of the organ which must result where a prolonged convalescence takes place following a delivery, the increased danger of infection that is present, the long train of symptoms that arise as secondary results of such conditions make it extremely desirable that the part should be repaired at as early a date as possible. He can understand that the cicatricial changes that follow in these structures will be of such a character as to render it difficult at a later date to overcome the alterations which have occurred and to restore the parts to a normal condition. In operating he agrees with the readers of the papers as to the great importance of thorough asepsis in every step of the procedure, making sure that there is no opportunity for introduction of infection. One can understand that the possibility of infection must influence our procedure as to whether it shall be immediate, intermediate or, at a later date. If he were engaged in the practice of obstetrics he should endeavor to so practise that he would be able to repair at once injuries that have taken place. As a gynecologist, who is likely to see these cases sometime after the delivery of the patient, he should be anxious to know something of the methods of procedure of the obstetrician in attendance, prior to restoring to immediate repair of cervix, vagina, or perineum. If he knew nothing of his methods, he should hesitate about the imme-

mediate repair of such lacerations. He said he had knowledge of a number of cases of lacerations of the pelvic floor where the immediate repair was made, in which aseptic precautions had not been employed by the attendant upon the case, and in which sepsis developed, and in which it was necessary to remove sutures to give the patient a chance for recovery. He recalled seeing a case some years ago in consultation with some three physicians, and he was to decide as to the advisability of removing the uterus. On examination he found that there had been a bilateral laceration of the cervix into the lateral fornix to the peritoneum. There was laceration of the perineum to the sphincter. The perineum had been repaired with the result that the tissues were bathed with a lot of decomposing material and the woman had a high fever. Instead of doing hysterectomy he advised that the perineal sutures be removed, and the entire cavity irrigated and packed with gauze. He was called a few hours later to find the patient with a temperature of 106° F. She, however, subsequently recovered. He had seen other cases in which the immediate repair of the perineum has been followed by a large amount of necrotic tissue between the sutures, no union taking place and the necrotic tissue giving rise to danger from the absorption of the putrescent material rendering the condition perilous. Objection is sometimes made to immediate repair of the cervix from the fact that the parts are so relaxed that the sutures have to be tied firmly, and owing to the rapid involution, the parts become loosened and union does not result. The classical case spoken of by Montrose A. Pallen is well known, in which he immediately repaired a laceration of the cervix and had good union. The immediate repair of the cervix would lead in some cases—but he does not know that this is an objection—to the performance of an operation which would, with ordinary aseptic precautions, prove unnecessary. The profession knows that, in the great majority of primigravidæ, laceration of the cervix to a greater or less degree occurs. At one time, at the Philadelphia Hospital, the doctor examined every patient delivered and found laceration had occurred in every one; and, in the great majority of the cases the laceration healed spontaneously. He fully agrees with what the last speaker has said regarding caution in making proper apposition of the muscles. Such care will add very greatly to the comfort of the patient. He is fond of catgut in all plastic operations on the vagina. The acid secretion of the vagina, however, will give rise to more rapid disappearance of the catgut than is evident in other parts of the body, so that the ten-day catgut will not last that long in the vagina. He prefers the chromicized gut prepared to last twenty days. In some cases he had found that catgut prepared for a short time has been absorbed too soon and there is stretching of the parts and formation of cicatricial tissue. If the vagina and perineum are to be operated upon he would feel it absolutely necessary that the operation should include every laceration in the genital canal, that he cervix and the vaginal walls should receive prompt attention as well as the laceration of the perineum; otherwise, there would be danger to the patient from the accumulation of material in the vagina giving rise to septic processes.

Dr. John G. Clark said he had been much interested in the two papers presented this evening, for they bear upon practical subjects which have recently been discussed before the meeting of the

American Gynecological Society in Boston. If one were to designate the various times at which a lacerated cervix may be repaired he should speak of them as: first, the immediate, within a few hours after the delivery; second, the intermediate, five to ten days after confinement; and, third, the more remote, at any time after the completion of the puerperal period.

Fifth Day Repair of the Cervix.—Dr. Dickinson, to whom Dr. Hirst has referred, read a paper on his experience relative to the fifth day repair of the cervix. In general he advocated waiting five days for the repair of all lacerations of the cervix, except in the three following classes of cases: (1) Those in which there is a profuse hemorrhage from the laceration; (2) those in which there had been bilateral incisions, such as in the Dührssen operation; (3) those in which the cervix is low in the vagina and may easily be reached at the time of the perinorrhaphy. In the discussion of the immediate and more remote repair of the cervix, one must first take into account the time when injuries to the perineum are sutured. Dr. Davis, in his paper, advocates the immediate repair of the perineum under careful operative technic and Dr. Clark believes he has struck the keynote when he insists upon the latter point, for the same care should be observed in these cases as in any other surgical procedure. First, as to the wisdom of an immediate repair of the perineum. For several years the consensus of opinion has been entirely in favor of prompt attention to vaginal lacerations at the completion of parturition. When the bad surroundings are taken into consideration, under which these operations are necessarily performed and the uniformly good results following these repairs, he does not believe a general departure from this custom is justified. If under unfavorable conditions these results follow, one may expect even more perfect healing of these wounds when treated as Dr. Davis described. If it is admitted that the perineum should be at once repaired, then he can see but one conclusion, and that is that the cervix should be either immediately repaired in meeting Dickinson's primary indications, or if deferred, at a more remote day after the puerperium is completed. Certainly the primary conditions noted by Dickinson, indicating the immediate repair, are well grounded and he should unquestionably adhere to them. Concerning the five-day intermediate repair he is, however, skeptical as to its ultimate value. One sees so many cases in which healing occurs most satisfactorily when left alone that he can see no reason for reversing this almost universal observation and the teaching upon this point. If primary healing is not satisfactory the more remote trachelorrhaphy is so good, that to break into a woman's early convalescence and throw her house into turmoil six days after her labor by giving her ether and subjecting her to an operation in these early days at a time when the milk secretion is fairly established and the baby is nursing well, is not justified by the surgical exigencies of the case. It is preferable, therefore, that either an immediate repair or, in the event of delay, a trachelorrhaphy be performed at some more convenient period after the completion of the puerperium.

In the discussion of the immediate repair, before the American Gynecological Society, Clifton Edgar, and Cragin, of New York, Williams, of Baltimore, Craig, of Boston, and Wakefield, of San Francisco, all expressed opinions opposed to the immediate re-

pair of a lacerated cervix. Cragin admitted that it might be done by skilled hands successfully, but that he could not sanction this teaching to students.

While he has no doubt that these injuries, if repaired in a well-equipped maternity hospital, will do well, yet the vast number of labors in this and all countries occur in private houses, in the majority of which there are no facilities for the more careful work required for repairing a lacerated cervix. While it would be ideal to have all women confined in maternity hospitals, or if in private houses to have an expert in consultation, the domestic environments of the parturient woman are usually such that this will never be the case, consequently one must consider these operations from the standpoint of the conditions under which they will usually be performed. Therefore, he believes that if the immediate or five-day repair were generally to be adopted, not only could the morbidity but also the mortality of puerperal cases overbalance the good which this procedure might do, if solely confined to the hands of the specialist. He considers, however, that Dr. Hirst is quite justified in carrying out this procedure in a maternity hospital, but agrees with Cragin and others that the teaching of this doctrine is hazardous. If it is the right course to pursue it should be quite fully sustained by not only the immediate but the more remote operative results, which will subsequently be reported from obstetrical clinics. Until that time this procedure will be open to discussion.

Dr. Stricker Coles said, in taking up this discussion, he wished first to speak of his own results. He has, for the last ten years, closed all lacerations of anterior and posterior vaginal walls and in the cervix, if the tear was large, immediately after labor; had not had to delay the closure in a single case for twenty-four hours, for he prepares for it before each delivery. His results in closure of the cervix have not always been good. They are better now than when he began, for then he did not appreciate fully the elongated condition of the cervix and its rapid involution. The stitches should be placed at the uppermost part of the tear, but should not be placed too far down, as the lumen of the cervix will be narrowed, and the flow of lochia will be retarded. So far he has not had any cases of infection of subinvolution, and may class the result fair with no inconvenience to the patient. His results with immediate closure of the perineum, pelvic floor and anterior vaginal wall have been most satisfactory, even when the tear was complete. The cases operated on in very poor surroundings and with very little care have done well. Dr. Davis has gone very carefully over lacerations of the vaginal wall and he can add nothing, but wishes to emphasize the importance of bringing muscle to muscle, and to do this the buried suture is often necessary to bring the retracted ends into direct apposition. The great objection to immediate closure is the swollen and edematous condition of the parts. This he tries to obviate as far as possible by watching his cases and not allowing the tissue to become devitalized by prolonged pressure. He considers the healthy epithelial cell the best barrier against sepsis and always tries to protect and to keep its continuity. He has had no experience with the intermediate closure of lacerations and will await the results of others to see whether sepsis will not be more frequent when raw surfaces are left exposed for five or ten days, also what will be the effects of an operation at this time on the mother's milk. This method

does not seem applicable to the greatest number of cases as they cannot afford to pay for this extra operation, for obstetrical cases now pay very poorly if they are properly attended. If the method is taught to students, many cases will not be closed at all, for deferring the operation for five or ten days, it will be neglected or rejected. When done immediately the operation takes a very few minutes, causes the patient no inconvenience and slight pain, and gives almost as good a result with the cervix and equally as good with the perineum, pelvic floor and anterior vaginal wall, and can be applied at home or in the hospital to the rich or poor.

Dr. E. P. Bernardy said, in regard to the immediate operation, the query has been in his mind. Why should not lacerations of the uterus be sewed up as well as lacerations of the perineum. It can be done readily. He has done it and the results have been very good, without elevation of temperature and the patients recovered with good results. In the treatment of these cases there must be created a thoroughly good field of asepsis. Needle, catgut and everything should be properly prepared, even at the bedside of the patient before being used. Under those circumstances the results will be good. He has never operated at the intermediate or five or ten-day period, but since hearing Dr. Hirst's paper he would not hesitate to do it. He thinks the patient would get along better than to run the chance of healing. Some lacerations of the cervix, as is well known, do heal, but only about twenty-five per cent.; the other seventy-five per cent. either are operated on or the patients live with lacerated cervixes. Lacerations of the perineum he stitches immediately after the birth of the child. He recollects one case in which he was called in consultation in which twenty-two stitches were used in the vagina and perineum, and in which on the ninth day the patient left her bed entirely well, and without a sign in the perineum and vagina that there had been in laceration. Therefore, he thinks one ought to stitch at once. In very bad cases where the parts are mutilated and blue and black, always try to bring the tissues back to their normal condition by douching with warm saline solutions before stitching and the results will be invariably good.

Dr. George M. Boyd said that this subject is of great interest to everyone practising obstetrics. If he understands Dr. Hirst's paper, he does not believe in the immediate repair of the cervix. That is the consensus of opinion. Dr. Hirst repairs the cervix after the fifth day. Every obstetrician repairs the cervix. If it bleeds a stitch or two are put in it. It seemed to him that it would be bad teaching to tell the average family doctor, who must be an obstetrician, to sew up every cervix. As Dr. Montgomery has stated, upon examination one finds that nearly every case has laceration. The debatable point is the intermediate operation, and Dr. Boyd has not had experience with that kind of operation. The satisfactory results of Dr. Hirst, however, would tempt one to try it. He feels that it is the duty of the obstetrician to get the patient in the best possible condition before she leaves the maternities. He agrees with the doctor in that he does not believe the average maternity has been sufficiently careful in the past to bring about the proper repair of injuries after labor.

Dr. O. Hopkinson, Jr., said he thought it would be extremely unfortunate if the young graduates were instructed to repair the cervix immediately

after labor. The tears, in his experience, have been bilateral and the anterior lip is much larger, edematous and more easily reached than the posterior. In one case a man without much experience in repair of the cervix after labor tried to pull the posterior down even with the anterior, and of course, tension was so great that he tissues gave way. Therefore, he thinks, that the repair of the cervix immediately after delivery is one which ought to be done by some one with experience. He thinks it safer, unless a hemorrhage confronts one, to leave it alone for five days (with which operation he has had no experience yet), or, until later on.

Dr. Theodore A. Erck said that the point in the question of the immediate or intermediate repair of the cervix is, how much is the woman going to be benefited. If every young man is taught that he should repair every laceration of the cervix immediately or immediately, Dr. Erck believes many cervixes will be repaired unnecessarily. Two of the gentlemen have spoken of the difficulty of making a good immediate repair of the cervix. The young graduate has not usually at first all the advantages of practising where the necessary aseptic detail can be carried out. Many of these men will become expert in a year or two, but how much will womankind have to suffer as a result of that operation? This should be considered. Dr. Erck places stitches for laceration of the perineum at the termination of labor. The obstetrician has seen and operated on cases in which the result of the primary repair was a failure and Dr. Erck would like to suggest the substitution of silkworm-gut for catgut in these operations so that the operator will see the result of his operation during removal of the stitches.

Dr. Richard C. Norris apologized for leaving the Chair to take part in the discussion. He said, in the first place, he thought one must consider the intermediate operation from two viewpoints: (1) Its practicability; and (2) its results. Here one must view the practice of obstetrics from its highest plane and study the question especially from the standpoint of results. Whether the operation is practicable in private practice, in the hands of the average doctor, is an open question. It has been the experience of most men in the past, that the immediate operation for laceration of the cervix, unless done for the special indication of hemorrhage, is not a justifiable one. When the intermediate repair is chosen patients examined on the sixth, seventh or eighth day of the puerperium, the cases of spontaneous healing of the cervix will be found to be pretty well advanced, and the experienced surgeon would not operate on such a case. If spontaneous healing has not occurred, he operates at this time, and those who have done this work know that it can be done successfully. Operation on the cervix after the sixth or seventh day, in Dr. Norris's own experience has been quite as successful as occurs in the later operations to which Dr. Clark referred. This question is discussed from the standpoint of what capable surgeons can do. If equally satisfactory union follows an intermediate operation, and it certainly does, what advantages can accrue to the patient by delay? Dr. Clark speaks of getting excellent union at the remote operation, but in many of the cases, while the wound in the cervix united, the uterus has undergone chronic interstitial changes, and there has been evolved a train of symptoms which often persist and would not exist, if the cervix had been repaired at an early date.

Viewed from the standpoint of results, the intermediate operation upon the cervix can be depended upon to give as good union as the remote and by the early operation one spares the patient a train of ills. That the immediate repair of the cervix is not satisfactory, is the opinion of the men who have had the widest experience; the intermediate operation can be and is a successful operation, as shown by those who have had experience with it. When one approaches the study of the best time for the repair of the perineum and pelvic floor one again has to view it from the standpoint of results. If it can be demonstrated that better results will follow an immediate operation than can be obtained by the intermediate operation, then Dr. Norris thinks it must be taken for granted that the immediate operation should be done, and the advantage of the intermediate cervix repair must be abandoned. Viewed from past experience the immediate operation has been a success. If it can be demonstrated that the operation on the perineum has no disadvantages by being delayed and that equally good results can be obtained then the combined intermediate repair of both cervix and perineum will be the ideal treatment from the surgical standpoint. This question narrows itself down to a matter of personal experience. Only those men who have done the operation are in a position to criticize it. Dr. Norris propounds these questions: Is it justifiable to allow the patient to wait? Is there added danger of infection? If the obstetrician is not surgically clean, if he has carried dirty fingers into the vagina, if he has not conducted the labor with the highest grade of asepsis and antisepsis, he had better not operate either immediately or after a few days. If he has carried infection into the woman's vagina, sewing up the perineum at once is not going to protect her. It should be determined by actual experiment whether there is any detriment to the patient to allow her perineum and pelvic floor to remain unrepaired for six or eight days. Those men who have tried it, say there is no disadvantage to the woman. There would not be so many secondary operations, if the average doctor did not neglect to at once repair these cases, and yet their patients so neglected seldom have serious infection. The severest cases of infection, as a rule, are not the ones of lacerated perineum that have been neglected. The infection is in the uterus, not the vagina. Dr. Norris is convinced that the intermediate operation has no serious disadvantage, and from his experimental knowledge, acquired with the desire to test this question, he believes there is no disadvantage in a clean case in allowing the perineum to go unrepaired for the length of time necessary to obtain good results for the repair of the cervix. As to results, he has been wonderfully surprised. One would expect that there would be failure of union, but in the cases in which he has operated, that has not been the case. A man must put his theoretical objections to the practical test before his opinion has real value. If this question is studied from the standpoints of instruction of students and what the average practitioner will do, its practical value to them is questionable, because the average practitioner and the recent graduate are not skilled operators. If he gets bad results in the primary operation he will get bad results in the intermediate. He had better do the best he can with immediate repair of the perineum and when the patient is convalescent, send her to a gynecologist

for reasonably early repair of the cervix. Dr. Norris believes as time goes on the new generation of doctors will be well prepared for clean surgical and obstetrical work, and that intermediate operation on both the cervix and pelvic floor will gain in popularity with the profession. Among the more intelligent class of private patients, appreciation of the ultimate gain to the patient will offset the natural objections on the part of the patient and her family of an anesthetic and a formal operation following so closely the anxiety of the confinement.

Dr. B. C. Hirst remarked that this question cannot be decided by theorists, but only by men with large practical experience. His own experience with reference to the cervix and perineum coincides with Dr. Norris's. Until three and a half years ago Dr. Hirst believed it a bad plan to attempt too much in the way of repair, but he happened to run across Lusk's statement regarding repair of the cervix and he saw one or two articles scattered through medical literature advocating primary repair, so he determined to try it. As a result of that trial, for three and a half years, in an experience comprising more than 150 cervical operations alone in the University Maternity, besides a number in other hospitals and private practice, he is in a position to recommend the procedure. As far as the instruction of students is concerned, it seemed to him to be the duty to teach students to do the best. Fifty or sixty years ago the average practitioner was not able to use the forceps. One old graduate told Dr. Hirst that when he left the University some fifty years ago to settle in the country, he took an obstetric forceps with him, and that an old practitioner having a case of adherent placenta sent for him to bring those new-fangled instruments and see what he could do with them. He thinks that in the near future the majority of physicians in general practice will do this work well, or they will not do it at all. In the University Maternity more than 50 cervical operations are demonstrated every season, done usually at the end of the week, to a class of about ten men each, so that each man acts as assistant in about five cervical operations. It seemed to Dr. Hirst that these students ought to be prepared to do this work as it should be done. There seems to be some confusion as to why the intermediate operation should be preferred. He first thought the immediate operation was the better one and he tried it in 40 or 50 cases, but found that there was too large a percentage of fever after the repair of the cervix immediately. While it was fortunate that there were no serious or fatal cases of sepsis, there was a higher proportion of morbidity than should prevail in a well-managed maternity. After the intermediate operation this tendency is not observable.

Dr. Clark referred to the discussion before the American Gynecological Association. The mere statement of the views of the men who took part without any explanation might lead one astray. Those gentlemen who criticized the procedure adversely have never tried it. Taking this fact into consideration, one can better judge of the value of some of the remarks that were made. Dr. Dickinson is right in many particulars, but wrong in one, when he says that if the perineum must be repaired then the cervix also should be immediately repaired. There is no harm whatever in letting the perineum go to the end of a week. The man who says that, because the perineum ought to be repaired early, the cervix ought to be also, is wrong. Such an opinion is not

based on correct observation, and perhaps, not on sufficient clinical material.

Dr. E. P. Davis said he had not observed the absorption of No. 10 catgut alluded to by Dr. Montgomery in puerperal cases. It seemed to Dr. Davis the reaction of the lochial discharge is not the same as that in the vagina of a woman not parturient. Regarding the repair of the cervix, he had had some experience and much interest in one aspect of the question, that is, in the immediate repair of the cervix; and, by "immediate" I mean within an hour after the expulsion of the child; not immediate in the sense of twelve or twenty-four hours. In a certain class of cases, the results have been satisfactory. The cases are watched through the entire labor and the tissues are not allowed to become nodular, edematous or bruised. When delivery occurred, frequently under forceps, the entire genital tract up to the internal os was inspected for lacerations. If lacerations of the cervix were found more than one-quarter of an inch, they were closed; so were lacerations of the pelvic floor and perineum. Dr. Davis has seen no fever following this style of procedure. He has seen a considerable number of very satisfactory union in the cervix, and, of course, a very high percentage of union in the pelvic floor and perineum. Those cases were in good hands and the operation was practically immediate. The so-called, intermediate, or five or seven day operations, is on trial. When that is proven to be a successful procedure he shall be glad to follow it. He sees no reason why it should not be successful in many cases, but the matter comes down, especially to his own mind, to this: Is obstetrics to be done as a makeshift, a disagreeable necessity by the practitioner, to eke out his living; or, is it to be a surgical specialty? A large number will fall into all sorts of unskilful hands, and in such hands, the least interference, the better; but, if obstetrics is to take the place of a surgical specialty, then the students will develop an individual aptitude for practice, and some will take up medical work; others will do surgical work, and those students will be competent to perform operations on the genital tract, whether it be done within an hour, in ten or twelve days or in two or three weeks, and the work will go to those men. It ought to go to them, and the sooner the better.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON ORTHOPEDIC SURGERY.

Stated Meeting, held October 21, 1904.

The President, Homer Gibney, M.D., in the Chair.

Congenital Scoliosis.—Dr. Reginald Sayre presented this case. He said that the baby came to the Clinic when it was three days old, and a short time after that a photograph and also an X-ray picture had been taken of the spine, which has congenital lateral curvature. These are not seen frequently, and Dr. Sayre thought the case sufficiently interesting to present. The picture was not very good, he said, on account of the difficulty in keeping the child still. The only possible way to do this was to hold the child by the arms, and in the efforts to keep it still the lateral curvature was straightened out. The skiagraph shows very sudden angling laterally, at about the eleventh and twelfth ribs, where there is coalescence of the ribs on one side, and rather marked gaping on the other side. Dr. Sayre said he remembered showing a patient a number of years ago, before this Society, that had lat-

eral curvature, which, according to the mother's statement, was traumatic, this baby having been a transverse presentation and apparently having suffered separation of the ribs from the costal cartilages. On the right side the lower ribs almost touched the pelvis, and the upper ribs were up under the axilla. The mother said the condition was present from the time of birth—that a great deal of force had been used at the time of delivery. In this case there is no history of similar conditions, as far as can be ascertained. This baby has a large left inguinal hernia. The baby has stretched out a good deal on its contracted side since it was first seen. Dr. Sayre had instructed the mother to manipulate the baby, stretching it out, and it had been kept in a sort of cradle on its contracted side, stretching it out. An apparatus had since been used somewhat like that employed in the after-treatment of toricollis, pressing against the head, and making pressure against the chest walls on this bulging side. (Indicating). The child's right thumb has been almost amputated by intra-uterine bands. The baby is now nine weeks old.

Dr. Homer Gibney said, the interesting feature to him had been the angular deformity with the marked lateral curvature. He had seen a number of them, but he did not remember having seen one with such marked angular deformity.

Dr. Sayre showed another case, a boy, asking for diagnosis. He came to see Dr. Sayre a couple of weeks ago, the mother stating that he had limped for a few weeks previously, and complained of some stiffness in his hip. There was pain in the left shin, apparently no atrophy, possibly slight shortening of left lower extremity; not positive about this. Symptoms more marked at present than when boy was first seen. Nothing had as yet been done in the way of treatment, as it was desired to have the boy first seen by the members of the Section. The mother said nothing wrong had been noticed about him until a couple of weeks ago, when he started to walk lame. Dr. Sayre said he made a diagnosis of something the matter with his left hip, but he thought probably he had had a fall and chipped his acetabulum, or injured it in some way which showed very little on the outside, but caused him to have a slight limp. He was very much surprised on taking an X-ray to see that the head of the femur presented a honeycomb appearance, the upper half being almost destroyed. It was astonishing to see such a slight limp, and pain for only a few weeks, and such slight restriction of motion, and yet have such an extensive destruction of the femoral head—a process which had evidently lasted many months, judging from the condition of the bone as shown by skiagraph. Dr. Sayre said he recollected a similar X-ray shown by Dr. Frauenthal years ago, of a boy who had had a tuberculous hip with an enormous abscess, and who had recovered with a certain amount of shortening, but a large range of motion, the boy running around at the time, with a very useful leg. On looking at the picture, one would have imagined the only thing to do would be to scoop out the entire joint. It looked like a large sponge in the X-ray picture. The boy had more than two-thirds of the proper motion in his joint, and with the exception of the shortening, had a very useful leg. He proposed in the present case to apply a long traction hip-splint to free the diseased femur from weight bearing.

Dr. Homer Gibney said that it seemed extraordinary to find a boy with flexion, ad- and abduction, none of the motions interfered with except slightly, but to find an X-ray showing destruction of the head of the bone—the appearance of a coxa vara.

Dr. Myers said, in regard to the case of congenital scoliosis that he had never seen such a marked case. These cases were rare and the few he had seen had proved very difficult to correct. It had taken a good many years. In this case the lateral deviation was very marked, but the rotation very little in comparison. He asked Dr. Sayre his opinion as to the possibilities of the curvature of the spine having been produced by injuries.

Dr. Sayre said he would suppose it was quite possible there may have been some intra-uterine disturbances, the right thumb was amputated by an intra-uterine band, in all probability, and there may have been some other bands which caused the marked deformity of ribs and vertebrae. It is not at all the ordinary type of lateral curvature one sees in later years, but a wedge-shaped condition of two vertebrae, causing an abrupt twist in the spine with little rotation, leaving the child partly broken in two. The mother says it was a more or less difficult birth, but no instruments were used.

Dr. Myers said, in regard to the second case, boy with injured hip, that he thought there was some limitation of every motion except flexion. It certainly was most remarkable to find such good motion and function with such extensive destruction of the upper half of the head. This erosion, together with the lessened inclination of the neck, must represent a shortening of three-quarters of an inch, which has been entirely compensated for elsewhere, as there is no shortening by measurement from anterior superior spine to interior malleolus.

Hallux Valgus.—Dr. Sinclair Tousey presented this case, with X-ray pictures of that and other cases, and read a paper describing this operation.

Dr. Sayre, in the discussion, said he had been very much interested in the case of hallux valgus, and congratulated Dr. Tousey on the very good result. In looking at the pictures, it seemed to him it is generally seen in these cases that it is not really a hypertrophy of the head of the first metatarsal bone so much as a subluxation of the phalanx on the metatarsal bone, and theoretically he imagined that a division of the ligaments and replacing of dislocated bone would be the better operation. So far as he knew, no one had done this, although for the past six or seven years it had been suggested at various meetings. Before the days of X-ray photography the projecting subluxation of the head of the metatarsal bone was supposed to be an exostosis. Until it is looked at in the X-ray picture, one would imagine there was simply an abnormal distance between the first and second metatarsal bones, and subluxation off the first phalanx on the first metatarsal bone. The practical results of the bone operation leave nothing to be desired. He had done operations on cases somewhat after the manner described by Dr. Tousey, and the results had been so good that he had not tried replacement of the subluxation after division of ligaments, although theoretically it would seem to him to be required in these cases. It has been found more sensible to utilize the abnormal articulation by cutting the bone behind the articulative surface, as Dr. Tousey has done.

Dr. Myers said that Dr. Keller, in the *New York Medical Journal*, of October 15, spoke of the dangers of destroying the tripod of the foot; the resulting deformity, weakness and painful callosities were as bad as the original condition. Excision of the head of the metatarsal bone would cause the loss of the inner support, so he recommended the excision of the base of the first phalanx instead. In the case presented by Dr. Tousey, there was very good support on the inside, there was no pain and no fatigue in walking, so the objection mentioned did not apply to the operation he described. Dr. Myers had operated by this method, and the results had been satisfactory. Valpius (*New York Medical Journal*, October 8, 1904) said Weid had, in a number of such cases successfully transposed the extensor tendon to the inside of the great toe.

Case of Multiple Exostoses.—Dr. Myers presented this case, with skiagraph. R. F., twelve years old. His mother and her sister have exostoses on their tibiae. Patient has two healthy brothers. There is no history of injury or muscular strain. There are large exostoses upon or near the epiphyseal lines at the lower ends of both femora, tibiae, fibulae and radii, at the upper extremities of both humeri, tibiae and fibulae, also at the junction of rib with cartilage anteriorly of the second rib left, and seventh, eighth and ninth on right. The tumors are multiform, nodular, like ridges or spiculae. They have only been noticed for two or three years, and while growing have not as yet interfered with function. They are painless.

Dr. Sayre said, in the discussion on Dr. Tousey's cases, that cases of congenital injury were to him very interesting. They have been described as congenital dislocations a number of times, but all those that had come under his personal observation had apparently had fractures associated with the dislocation. Those cases do not seem like congenital dislocation of the hip in that respect, and the results of treatment that he had had or seen in the hands of others, have not been remarkably favorable. Several cases he had seen reported at the societies did not seem to him to be very much improved as to range of motion after operation compared with range of motion that he had seen in them prior to the operation. He had recently endeavored to reduce one by manipulation, and thought he had improved the child very materially at that time, but since removing the dressing, he thought he had not noticed a great gain; although the position of the head in relation to its glenoid cavity was improved, he did not think the range of motion materially increased over what the child had when the head of its humerus was articulated in the new glenoid it was excavating for itself behind the original one.

Dr. Tousey said that in radiographing the spine the light was above the abdomen, the patient lying on the back, the X-ray tube being directly over the median line of the body and over the center of the plate. He thought one reason for his success in getting the detail of the spine was that he had the patient in a position similar to the lithotomy position, which obliterated the hollow of the back and brought the lumbar vertebrae in contact with the photographic plate as well as the dorsal and sacral portions of the spine. In addition he made use of a "board compressor" of his own device, thin enough to be perfectly transparent to the X-ray, placed flat across the abdomen and strapped down so as to

press upon the abdomen and make the thickness of tissue three inches less than that which the X-ray would have to penetrate without this appliance.

In reply to a question by Dr. Sayre, Dr. Tousey said that the plate was exposed exactly two minutes.

Dr. Twinch said that Dr. Osgood, of Boston, in endeavoring to get a good picture of the spine, hit upon the plan of pressing a tomato can very heavily into the abdomen, in that way getting a very good detail of the spine.

Dr. Homer Gibney said, the Chair would like to compliment Dr. Tousey and say as to operations on hallux valgus that he had the pleasure of meeting Dr. Tousey this summer, and asked him to read a paper and show cases before our Section, and then narrated a case on whom the same operation had been done, except that the speaker usually used the lateral incision, and found a lot of hypertrophied tissue—bunion—he excised that, then closed the wound, using a pad between the first and second toes. A number of these cases had been done with most gratifying results. The shoulder case was interesting. One is at a loss to know just exactly what to do with these shoulders injured at birth or during labor; they are numerous at Clinic or Dispensary, and, as Dr. Sayre truthfully says, great trouble is experienced in their management and the results are not brilliant. Dr. Tousey said, in closing the discussion, that Dr. Jäger was right about the result immediately after operation being a better looking foot than it is some months later. This patient's last foot was operated on five months ago, so the present result is probably a permanent one. Dr. Tousey said that he could, however, see, on recalling the looks of the two feet immediately after the operation, that they have decidedly deviated from the straight line. At the time of the operations, he had those two toes in an absolutely straight line with the metatarsal bones. In regard to the possibility of straightening such feet without a bone operation, he had experimented some little time on the feet by traction, measurements, and so on, to see if any division of the soft parts would promise a better result, but he found that the ligaments, etc., were so short that he had to divide some of them even to accomplish the rectification which he had accomplished. Combined with osteotomy, he had to make a slight incision in the fibrous tissue. The man stands on his feet eighteen hours a day, handling baggage. He is one of the fellows that break our trunks, etc., at the Grand Central Station, so that the functional result for the present is certainly very good and according to the outlook bids fair to be permanent.

Dr. Homer Gibney exhibited an apparatus devised at the Forty-second Street Hospital by one of the staff, for the application of spicas, single and double. We all know how difficult it is to get the shoulders and hips on the same plane, and this is a little scheme of his, to overcome the difficulty. It can be altered according to the size of the child, and length of limb. The apparatus is used at the Dispensary every afternoon, and it is used in private practice. It is giving general satisfaction. Dr. Eickenburg, the designer of the apparatus, is at present in Chicago, assisting Dr. Ridlon. It is a very simple device—a modification of the Lorenz hip rest. It is made in the shop at the hospital. It has been in use for some time now and promises to give excellent results.

BOOK REVIEWS.

THE PRINCIPLES AND PRACTICE OF GYNECOLOGY. By E. C. DUDLEY, A.M., M.D., President of the American Gynecological Society; Professor of Gynecology, Northwestern University Medical School; Gynecologist to St. Luke's and Wesley Hospitals, Chicago, etc. Fourth Edition. Lea Brothers & Company, Philadelphia and New York.

So much has been said in praise of the previous editions of this excellent gynecological treatise that the last edition might well be accepted on trust. The grouping of the subjects has almost without exception met with the unqualified approval of teachers and students. The usual manner of grouping all the diseases of some special organ in one part has not been followed, but the author has treated the various subjects from the standpoint of pathological and etiological sequence. The main subjects are grouped under four heads: (1) Infections and Inflammations, (2) Tumors, (3) Traumatism, (4) Displacements. In this classification the author has well emphasized the functional unity of all the reproductive organs, and allowed a study of pelvic diseases in the combined forms they ordinarily assume. The first section of the book is devoted to general surgical and gynecological principles set forth in careful detail, an essential to the student, a valuable reminder to the surgeon. A special chapter is devoted to the disorders of menstruation and sterility. The entire volume is abundantly illustrated, and is to be commended in that the surgical instrument catalogue element has been eliminated. It has evidently been the author's aim to show the instruments as they appear in actual work. All important manipulations and operations have been illustrated to show the steps of the various procedures. The work is thoroughly practical, based largely on clinical experience and in the main conservative. The volume in general supports the author's claim that it is suitable both for students and practitioners, although it is perhaps unwise to make a universal statement to the inexperienced that the occasional use of the intra-uterine sound or dilator may stimulate the menstrual flow without a word of warning, as has been done in the chapter on amenorrhea. The wisdom of the author may also be questioned in that he states that adhesions and contractions of a retroverted uterus may be stretched or broken by manipulations without mentioning the dangers of breaking up adhesions out of view or the possibility such a procedure might have of injuring diseased adnexa. The small number of personal cases cited is a pleasing feature of the book.

PHYSICIAN VERSUS BACTERIOLOGIST. By Prof. Dr. O. ROSENBACH, of Berlin. Authorized translation by Dr. Achilles Rose. Funk & Wagnalls Company, New York and London.

In this somewhat controversial discussion we find an excellent summary of the pros and cons of the bacteriological doctrines.

The author's chief theme seems to be that an undue proportion of attention is given to bacteriological methods and not enough to ordinary clinical methods. We cannot see that the points brought out are of much real value at the present time—but they place the readers *en rapport* with the attitude of the skeptic of ten to fifteen years ago.

The work will repay reading by the overenthusiastic laboratory worker who would neglect the patients for the microscope and test tube, and there are many excellent features of the book apart from its argumentative and disputatious undertone.